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THE AMERICAN PUBLIC HEALTH ASSOCIATION, PRESENT, PAST, AND FUTURE

W. S. RANKIN, M. D.,

President, American Public Health Association, Raleigh, N. C.

It will take you only twelve minutes to read what your President has to tell you. He gives you the facts concerning the A. P. H. A. and its program. Every member should read it.

This statement has been prepared with the singleness of purpose of supplying the reasons which may be presented to public-spirited citizens in general and to students and workers in the field of public health in particular, in asking their loyal support of the Association. It is assumed that the Association, to be entitled to one's interest and membership, must do three things: First, it must make clear that the field of service which it occupies is essential to the public welfare, and that it has a program of such general interest and proper proportions as to hold a legitimate claim to the larger and more intelligent thought of our people. Second, the Association, having existed fifty years, must make its appeal for support and loyalty not altogether on what it is, but also upon what use it has made of past opportunities, upon public service already rendered. Third, the Association must offer to its members, present and prospective, a program of future development, alluring in its possibilities and reasonably assured by the present condition and the past achievements of the Association.

WHAT THE ASSOCIATION IS

Essential Machinery: The American Public Health Association is an essential part of the public health machinery of the country. Upon the essential character of service which it renders, the Association, without the slightest misgivings, may rest its right to existence.

The Association is essential in the handling of the public health problem for the reason that it furnishes, and it alone furnishes, the common ground on which all of the various public health interests, both the scientific and the administrative agencies, investigators and officials, come together in a great clearing house of experience

and into dynamic contact with the inspiration of mass psychology.

Permanent Field: The American Public Health Association occupies a permanent field of service; permanent in that as long as time lasts it will be necessary for some agency to bring together the individual workers, separated in thought as in space, for conference, for collection and compilation of data, for reaching safe conclusions, and for adopting the best methods of work.

Program of General Interest: The American Public Health Association furnishes a program of general interest; general in that its program embraces the prevention, not of some particular disease or group of diseases, but of all preventable diseases; general in that its program embraces, not only disease prevention, but the much larger and more important field of health promotion; general in that it considers everything in the way of heredity and environment, in the way of habits and customs, that leads to disease or promotes health. The platform of the Association is, in length, breadth, and thickness, sufficient to accommodate all who are interested in human conservation.

Program of Symmetrical Growth: The Association believes in the relative values of special health problems; it has no hobbies; its ideal is an orderly, symmetrical, and closely coordinated public health program for the several branches of the Government, coupled with and supported by a broad and deep interest on the part of society in the general public health problem in all of its varied, but at the same time inseparably related, aspects.

THE PAST, OR WHAT THE ASSOCIATION HAS DONE

Since 1872, the Association has brought together regularly every year the diverse interests and varied experiences of those engaged in the work of human conservation, and has thus provided that each individual worker should share the knowledge and the idealism of the entire membership.

To reflect upon what would have been the course of related events had some particular agency of large and general influence not existed, is perhaps the best way of approximating its contribution to progress. If the work for which the Association is to be credited had not been done, what would be the present status of public health work? Would it be the same that it is today? Would it be one, two, three, four, five, or ten years behind its present state of development? To answer these questions is to weigh the influence and the work of the Association during its existence of fifty years. It seems safe to say that had the work not been done the present development of public health work would be at least five years behind where it is, that instead of working with the resources of popular interest, men, and money, that are available today, January, 1920, we would be using our equipment of January, 1915.

In rendering the above service to the public, the Association has exercised an influence that has been a very real service to all health departments—federal, state, and local. There is not a health officer in this country, conscious or unconscious of the fact, that has not been tremendously helped in his work through the influence of the Association; there is not a laboratory for diagnostic examinations or for the preparation of biological products, not a public or private laboratory, that has not had its field of service enlarged and its work more appreciated as a result of the influence of the Association; there is not a chair of hygiene or sanitary science in the colleges and universities of this country that has not had larger classes as a result of the influ-

ence of the Association; there is not a school of sanitary engineering, there is not a sanitary engineer interested in the construction of waterworks and sewerage that has not received very large and very material assistance through the influence of the Association; there is not an industrial establishment that employs public health nurses or medical officers in industrial hygiene that is not a debtor to the Association; there is not a life insurance company in this country that is not indebted to the Asociation to the extent of thousands of dollars for added premiums and unclaimed policies. And so it is clear that both those with special interest, the technical group, and those with general interest, the public, have been for years the beneficiaries of the Association; its blessings, like the life-giving dew of Heaven, have fallen on all, the just and the unjust, the appreciative and the unappreciative.

THE FUTURE OR WHAT THE ASSOCIATION PROPOSES

The future of the Association is dependent upon one thing,—its food supply. Its staple article of diet is attention, the attention of its members. In the metabolism of its growth attention is converted into vision, the vision of what the Association is, and what it has accomplished, and of the unlimited possibilities of its future; vision is transformed into interest, the interest of its members; and interest becomes oxidized or vitalized into energy, and so the Association lives and moves and has its being. But remember this: that the starting point in the growth and the work of the Association is attention, for vision and interest and energy and life are the intermediate and end-products of its metabolism.

The Association today is hungry. As an infant cries for its milk, so it appeals for its wanted food. Give it some. Give it ten minutes attention.

The Association today weighs 4,500 members and subscribers. When it has completed its infancy, finished cutting its milk teeth, it ought to weigh 7,500 members and subscribers. By that time it will have assimilated the more easily digestible food supply, namely, those persons who have a special interest in public health work. The completion of this period should be reached by autumn, 1920. The Association by that time should have completed a healthy infancy; should be ready for weaning; should be capable of assimilating a greater variety of food; should be able to attract and interest the general public.

PARTICIPATION OF THE PUBLIC

Dr. Frederick R. Green, of the American Medical Association, has well said that the public health movement has outgrown the stage where it could be regarded as a physician's problem and likewise had developed beyond where it could be considered as the legitimate charge of the wet-nurse, philanthropy. The time is at hand when the public is no longer to be thought of as beneficiaries in the public health movement, but are to be welcomed and trusted as participants. Participants, that is the word. Why shouldn't the public participate in the councils of their own elected officers and public servants; participate in the support of a great movement that in the most fundamental way concerns their present and their future? This is the day of democracy, of popular government. We profess to believe in it; let us show our faith by our works.

The public can be interested. The National Geographic Society has demonstrated this beyond the shadow of a doubt. That Society has a membership of 630,000, and must have something like an annual income from mem-

bers and advertising of not less than $3,000,000. If the intelligent people of this country can be interested and organized around a geographic idea, they can certainly be interested in a great public health program and organization.

But someone says the explanation of the National Geographic Society's size and strength is the magazine. That is exactly so, but it is easily possible to produce another magazine, devoted to health and life, as attractive and as interesting, and even more valuable than the excellent publication of the National Geographic Society. Moreover, sufficient funds to underwrite the publication of such a magazine, until the enlarged organization can be placed firmly upon its feet, are in sight, almost within touch, provided only the American Public Health Association can see its opportunity and line up solidly behind this larger idea of including the public within its membership.

Two separate public health organizations, one composed of those with special training, the teachers and the official directors of the public health movement of this country, and the other composed of the general public, is out of the question. The two groups should be combined, the technically trained group and the experts in various fields of public health work to furnish the facts and to suggest the policies, and the other to approve the policies suggested and to furnish the necessary support for their realization. The eyes and ears cannot be separated from the balanced judgment and the nerve and sinew of the social organism.

The two groups can be properly related under a carefully considered constitution and by-laws. An example of this possibility is the separation and the relation in the American Medical Association of those in charge of the scientific program, the Sections, and those in charge of the administration and the determination of the policies of the Association, the House and Delegates.

An American Public Health Association of from one hundred to three hundred or four hundred thousand members, tied together, kept in monthly touch with the organization through a splendid public health magazine; the average state with an affiliated state society of from five to thirty thousand members, and the average county or district with a society of from one hundred to one thousand members, a unit of the state society, all the people actively interested in the conservation of life, in the promotion of health, and this great problem will no longer be dependent upon the care of the physician or have to lean on artificial props of philanthropy, no longer an infant crawling and creeping, but rejoicing "like a strong man to run a race." This is the dream, the vision, and the reality. The only question is the date when the vision shall become the reality. The determination of that date rests with the members of the Association.

□

The first step is to increase the Members and Subscribers to 7,500. Your individual quota is One New Member. The A. P. H. A. does not ask more; it can't ask less. Decide whom you will invite to Membership.

Do it Now!

PROTECTIVE VALUE OF TYPHOID VACCINATION AS SHOWN BY THE EXPERIENCE OF THE AMERICAN TROOPS IN THE WAR

GEORGE A. SOPER, PH.D.,
Formerly Major, Sanitary Corps, U. S. A., New York City

Read before Section on Public Health Administration, American Public Health Association, at New Orleans, La., October 27, 1919.

It has recently been publicly argued that the Army reports demonstrate the failure of inoculation against typhoid fever. Major Soper distinctly contradicts this claim, states plainly how efficient it really was and explains some so-called failures. These were due to infection before vaccination, errors of haste in insufficient dosage or wrong counting, or worn immunity.

THE experience of the United States troops in the World War not only shows the value which attaches to typhoid vaccination, but affords a warning that this is not the only measure which should be taken to avoid typhoid and paratyphoid fevers.

That some typhoid occurred, in spite of the fact that the army was vaccinated against it, has led some to infer that vaccination proved to be a failure, whereas the opposite is the fact. When properly employed, and used in connection with other measures of prevention, vaccination was shown to be capable of affording a very large measure of protection.

It is to the unreasoning confidence which has been placed in typhoid vaccination, often to the entire exclusion of other precautions, that many of the seeming failures are attributable. But its strongest and wisest advocates do not pretend that it is a substitute for every other means of avoiding typhoid.

That typhoid did not assume any greater prevalence than it did in France, when under the stress of military necessity, all other safeguards were broken down, speaks well for this form of preventive treatment. The exposure of the troops to excremental infections was often very great. How great, may be inferred from the fact that there were times and places when 75 per cent of the men were more or less affected with intestinal diseases such, for example, as diarrhea and bacillary dysentery.

AMOUNT OF TYPHOID IN THE AMERICAN EXPEDITIONARY FORCES.

The following statistical data relating to the A. E. F., France, are taken from telegraphic reports. Although it is probable that some correction will have to be made in the figures when the final statistics are compiled from the clinical records, it is believed that the data are, in the main, reliable.

For the 101 weeks from October 18, 1917, to September 25, 1919, there were 1,529 cases of typhoid and 303 cases of paratyphoid, with 169 deaths. The average number of our troops which were in France during this period was 858,238. But, as will be explained presently, this average strength does not properly indicate the number of men from which the cases were derived, being much too small.

Of the 1,529 cases, 1,390 occurred within a period of about 9 months. That is, over 90 per cent appeared between July 25, 1918, and May 2, 1919. There were but 47 before this time, and 92 in the 5 months following.

The disease was not, therefore, evenly distributed in point of time. It was at first sporadic and then epidemic. Nine-tenths of the cases appeared during the epidemic period. During this period the number of our troops in France constantly increased. At the beginning of the epidemic the strength was 1,164,264 and at the end, 1,935,000. On the day when the greatest number of cases occurred the strength was 1,741,177. To say that the cases were derived from the average number of our troops in France during practically the whole expeditionary period is erroneous and gives an exaggerated idea of the typhoid rate. Nor is it fair to refer all the cases in the epidemic to the average number of troops during that time, for the beginning of the conditions which brought about the epidemic long antedated that period.

As to location, the epidemic was not confined to any limited area. Unlike most outbreaks in civil life, it was not due to any single water supply or other common source of infection. There were many sources. There were many outbreaks of small extent, and it was the aggregate of the cases in all of these outbreaks which made up the total count.

The epidemic was less conspicuously associated with place and season than with what may be termed the mode of life of the soldier. Among so many men it was inevitable that some should be potential foci and it was the mode of life which permitted some of these foci to become active. Thousands of young men of an age which is peculiarly susceptible to typhoid were compelled to live under conditions wherein no precautions were, or could be taken, to insure a rigid separation of their food and excrement. Under such circumstances frequent contamination of water and food with excremental virus was to be expected. The result was that all who could contract disease in this manner were attacked.

WHY THE EPIDEMIC GAINED HEADWAY.

It is easy to understand how the epidemic, once started, gained headway. Typhoid was not expected, and when it appeared it was not always recognized. Probably no disease more often fails of recognition in its early stages in civil life, and there the conditions are much more favorable for its diagnosis than they were among our fighting army in France. Among the sick and wounded there occurred many cases of typhoid before the nature of the disease was suspected. These cases increased the number of foci from which other cases sprung. The distribution of the disease was increased by reason of the fact that many of the infected men were sent from the front to more or less distant places for treatment.

It is almost always thus with outbreaks of contagious diseases. One case, or a few cases, if promptly recognized and properly cared for, are not particularly dangerous. But if a number of cases occur and remain undetected for some time, they lead to other cases and these to others in rapidly increasing ratio. Finally the infection becomes so general that it cannot be controlled and something like a conflagration follows.

The value of sanitation plus vaccination in protecting soldiers against typhoid and paratyphoid is shown in a way by the record of our troops in the United States during the war, although the exact measure of this benefit is obscured by a number of factors. It appears that some of the men were in a fair way to become sick when they entered the army; opportunities for infection were by no means absent in some of the cities and towns to which the soldiers resorted when on leave.

Much less typhoid occurred among the troops in the United States than among those in France. For the 108 weeks from September 1, 1917, to September 25, 1919, there were 466 cases of typhoid and 45 cases of paratyphoid, with 54 deaths. A considerable part of these cases appeared, before the three doses

of vaccine were all given, and under circumstances which pointed to the infection of the men before they reached camp. The average number of troops for the period stated has been given as 967,591.

For the year 1918 there were 240 cases of typhoid in the army in the United States, the average strength of which was 1,381,429.

These strengths do not represent the total number of troops from which the typhoid cases were derived, for about three million men passed through the camps in the course of a year.

It is believed to have been due both to vaccination and sanitation that there was so little typhoid among our troops when they were mobilized on the Mexican Border in 1916. The custom at that time was to vaccinate against typhoid only, while in the World War the vaccination was against paratyphoid A and B as well. Between May 1, and October 18, 1916, there were but 24 cases of typhoid, whereas more than ten times that number of paratyphoid cases occurred. There is no reason to suppose that the virus of typhoid did not exist to a greater extent than did the virus of paratyphoid, for among any large number of people this is almost invariably so. But the virus of typhoid did not lead to a general infection as it did in France apparently because the men lived under less insanitary conditions on the Border and the medical officers were more alive to the possibility of its appearance.

It is interesting to compare the records of our troops on the Mexican Border and in the World War with our army experience in the Spanish War of 1898, before typhoid vaccination was introduced. In the Spanish War there were 20,926 cases of typhoid and paratyphoid with 2,192 deaths among 147,795 troops in about 8 months. During the following year there were 2,184 cases and 258 deaths among 105,260 regular and volunteer troops. In 1900 there were 978 cases and 164 deaths among 100,389 troops. It was in 1911-12 that antityphoid vaccination became general in the army.

REASON FOR SEEMING AND REAL FAILURES IN VACCINATION.

There are various reasons why vaccination sometimes seems to fail, and there are reasons why it does fail, occasionally.

There have been instances in which the patient has fallen ill before the three doses of vaccine has been administered, infection having taken place beforehand.

In some cases the correct details of procedure have not all been complied with. In the haste which accompanied the mobilization of our army, in view of the great number of men to receive treatment, and considering the untrained personnel which was available to administer it, it is likely that mistakes now and then occurred. That something less than the standard dosage was sometimes given to the soldiers and that occasionally the records indicated that all three doses had been given to men who had, in reality, received only a part, or none at all, of their vaccination, are facts which must not be overlooked.

In considering the apparent failures of vaccination to protect, due allowance should be made for these exceptions. How often such mistakes were made is not known with certainty—it will always remain a matter of opinion.

Apparent failures of vaccination in civil life sometimes are attributable to the fact that the immunity conferred has worn off with the passage of time. In the United States Army the custom is to revaccinate every three years; but among civilians it is doubtful if the treatment is always so thorough or so rigorously repeated. Cases of outworn immunity should not be charged against preventive inoculation.

Some instances of failure in civil life are doubtless chargeable to imperfect vaccine and faulty technic of administra-

tion. Unfortunately, preventive inoculation is not so generally employed that every doctor possesses the degree of knowledge and skill necessary to administer it. But when all is said and done to excuse the failure of vaccination to protect, there remain a certain proportion of cases unaccounted for. In the army in the World War there were many soldiers who appear to have been vaccinated according to the best technic and who, nevertheless, were attacked within a year of two by typhoid or paratyphoid fevers. These need to be explained.

They can be explained on two hypotheses: either the prophylactic treatment did not render everyone who took it equally immune to ordinary doses of the virus, or those who were attacked were the victims of unusually large, and perhaps fresh, doses of the bacilli.

Most of the cases are believed by the regular army surgeons to have been due to "massive infection." They were instances in which such overwhelming doses of the virus were taken as to overcome the protection which had been conferred. It is needless to discuss this phenomenon here. Something like it happens now and then in smallpox and other infections. It appears to be a fact that very large doses, or perhaps very fresh ones, when taken singly or repeated, will produce typhoid in some persons who have been properly vaccinated or are believed to possess immunity by reason of having already had an attack of the disease.

Vaccination is not an infallible procedure. The idea is too prevalent among persons who have been vaccinated that they are completely and permanently immune and consequently need take no other precaution against it. This is an unwarranted supposition and one which is combatted by the Army Medical Department. The most recent pronouncement upon this point is contained in Special Regulations No. 28, War Department, Washington, March 11, 1919, as follows:

"The triple typhoid inoculation confers a high degree of protection against typhoid and paratyphoid fevers, but it does not give absolute protection against massive infection with the causative organisms. The use of the triple inoculation has enormously reduced the incidence of enteric fever in armies, but it does not warrant neglect of the other well-known sanitary precautions against the diseases. One of the most ready means of causing massive infection with typhoid and paratyphoid organisms is through the agency of a carrier employed in the handling of food."

TYPHOID NOT ASSOCIATED WITH THE INSANITARY CONDITIONS OF BATTLE FIELDS.

It would be of value to know whether it was "massive infection," incomplete immunity, or some other cause which produced typhoid outbreaks in the army which were not associated with the insanitary conditions of battle fields.

In an epidemic described by Hawn, Hopkins and Meader,[1] the first case appeared when the company left Camp Cody. Other cases occurred in a straggling way until the main outburst took place in a rest camp in England. By the time the organization left this camp there had been 38 cases. Later, there were more; so that, in a strength of 248 men there were 98 cases in all. All the men seem to have been vaccinated, save one. The cause of the typhoid was not definitely ascertained.

Four cases among 175 vaccinated men were described by Bradbury[2] as having occurred in the last three weeks of November, 1918, in the Eleventh Engineers, in France. The source was not found, but was assumed to have been a carrier in the kitchen.

Twelve cases were reported by Brown, Palfrey and Hart[3], at Camp Greene, in the United States. Nine were in a single organization. Investigation showed

[1]An Outbreak of Typhoid among American Troops in England; C. B. Hawn, J. D. Hopkins and F. M. Meader: Jour. A. M. A., Feb. 8, 1919, p. 402.

[2]Typhoid in a Company of Immunized Soldiers; Samuel Bradbury: Jour. A. M. A., Aug. 17, 1918, p. 582.

[3]Typhoid Fever Occurring after Prophylactic Inoculation; Claude P. Brown, Francis W. Palfrey and Leonard Hart: Jour. A. M. A., Feb. 15, 1919, p. 463.

that all the men had had the prophylactic treatment at various camps at proper intervals and within a year of their attack. The cases occurred coincidently with a mild epidemic in the neighboring city of Charlotte. The cause of the typhoid among the soldiers was not ascertained, but it was supposed to be due to "massive infection."

A careful review of the reports indicates that the type of infection which occurs by contact is the one most often associated with these outbreaks. The type is sporadic not explosive. Whether the infection be called "massive" or known by some other and more inclusive term, there seems to be something about crowding or close personal contact, which is particularly dangerous. It was a feature in connection with most, if not all, of the cases referred to in the three accounts just cited. It would not be surprising to learn that it was a no less prominent feature among the much greater number of cases in France. Apparently we are dealing here with contact infection, pure and simple. It may be well that it is less the massiveness of the dose than the relatively short direct route by which the virus passes from those who produce it to others that constitutes the danger.

IMPORTANCE OF CONFIRMATORY B. COLI TESTS IN FAIRLY SAFE DRINKING WATER

N. NOVICK,

Bacteriologist, U. S. P. H. S. Hospital, East Norfolk, Mass.

During the latter part of 1918 the writer was sent by the Bureau of Sanitary Service of the American Red Cross to assume the duties of bacteriologist of Sanitary Unit No. 33, stationed in Charleston, S. C., and working under the supervision of the U. S. P. H. S. The various health activities conducted by this organization were those generally known as Extra-Cantonment Zone sanitation. Since the protection of the uniformed men of the army and navy around the military posts was the chief object of the Extra-Cantonment activities, the safeguarding of the city water supply was, therefore, to be an important duty of the bacteriologist. Furthermore, the town being "dry," a considerable amount of so-called "soft drink" was being consumed. This appeared to bring in another factor which called for a careful watch on the supply of water used for drinking purposes.

The present paper has for its object the purpose of revealing some data bearing upon the value which may be derived from confirmatory *B. coli* tests if properly conducted in the routine examination of presumably good water.

Shortly after my arrival, it was found upon investigation that while the city water was examined daily by a local authority, the work was apparently conducted without sufficient regard for bacteriological standards, and seemingly no attempt was made to confirm the results to any extent.

Accordingly, on November 21, 1918, an examination of the water was made by the writer, with the following results:

Sample city water (Goose Creek), bacteria per cc. 24 hours, 37° C. 210; 9 acid colonies on lactose-litimus agar plates, 1 cc. portion. Lactose bile fermentation tube showed more than 10 per cent gas in 2 cc. portion. A complete confirmatory test was immediately made and the organism isolated was identified

as a member of the colon group. (Group 4, MacConkey.)

For the reason stated above, no data bearing upon the previous examination of the water supply were available for deductive comparison. A sanitary survey of the stream, from which practically the entire population of the city (there are some artesian wells in addition to the main supply) obtains its drinking water, seemed to bear favorably upon the sanitary quality of the water. Furthermore, during the time in question and in months previous, the city had suffered a scarcity of rainfall to such an extent that the level of the stream supplying drinking water had fallen to more than 3 inches below normal observations. The Water Works Commission requested the city, through the local daily press, to conserve water, and finally water was to be had only during certain hours of the day. It occurred to the writer that the supplying stream had apparently lost its normal diluting capacity which would probably account for a rather high bacterial count disregarding the apparently good sanitary condition of the source. However, a report of a water as cited above was open to suspicion. This report slightly alarmed the authorities, and corrections at the chlorination plant were made in due time.

During the subsequent months a regular and frequent examination (almost every day), of the water was instituted, the results of which are recorded in the accompanying table. Unfortunately other bacteriological duties arose, and more frequent examinations could not be made. Limited as the number of examinations was, the accompanying table shows that 75 to 100 per cent correct presumptives were obtained, although the bacterial count ran low and the quality of the water from the sanitary point of view had been assumed as good.

While the presence of members of the colon group carries the thought of possible pollution, the search for specific pathogens is never lost sight of by workers in the field of sanitary bacteriology. Recent literature* contains reports which would seem to indicate that properly conducted confirmatory tests are valuable and always called for in routine examinations.

The method of examination used during this work was that recommended by the Committee on Standard Methods of Water Analysis of the American Public Health Association (Standard Methods, 1917). Lactose bile in fermentation tubes, although not recommended in Standard Methods was used for a short time, but was later abandoned as it was not deemed necessary to use that medium which is, primarily, to block out non-colon species, for the water in question did not show an unusual bacterial count afterwards. Lactose broth was substituted. Lactose litimus agar in duplicate was used for direct plating along with the plain agar in order to gain tentative information as to the quality of the water in 1 cc. portions, and also to serve as a check on the fermentation tube receiving a similar portion. Gas

*E. M. Myer, Jour. Bact., Vol. 2, No. 1.
C. L. Ewing, Am. Jour. Pub. Health, Vol. 4, No. 4.

Period 1919	Number waters examined	Average bacteria per cc. 24 hrs. 37° C.	Highest count	Lowest count	Presumptive pos. tests	Confirmatory pos. tests	Percent correct presumptives	Percent pos. B. Coli	Direct plating lactose litmus agar 1 cc.	Number times abrog. found	Extent possible pollution
Jan.	11	39	100	9	7	4	57	36	—*	3	1 cc. portion
Feb.	12	15	28	6	4	4	100	33	—	1	1 cc.-5 cc. portions
Mar.	12	15	24	6	3	2	66	16	—	0	5 cc. portion
Apr.	8	19	48	5	1	0	0	0	—	0	5 cc. portion
May	14	15	42	6	4	3	75	21	—	1	5 cc. portion
Total	57	.....	.....	.....	19	13	Total %	22.8		5	

*—=No acid colonies present.

production was waited for not longer than 48 hours: .1, 1, 5, and 10 cc. portions were tested as a routine procedure; the smaller portions being inoculated into Smith fermentation tubes filled to the usual level, and the larger, into large test tubes holding an inverted vial and containing about 30 cc. of the broth, so as not to reduce the nutritive constituents of the medium, and particularly in order to conform to the Standard Methods. The medium was controlled both as to its sterility and its ability to produce changes, should the colon organism be present in the sample under test, the former by being incubated for 24 hours and the latter by receiving a broth culture of a known colon strain. For confirmatory tests, two loopfuls from the smallest portion of the water showing more than 10 per cent gas, were diluted in 10 cc. sterile water or saline solution, from which one loopful was pour-plated in lactose litimus agar at 45°C., and incubated for 24 hours at 37°C. The writer has always obtained a fairly good colony distribution in this manner, so when the plates were found to be positive, several colonies of ovate form were shown surrounded by a light acid zone (colon group), which could not be missed when the plate was held at the proper angle to the light. The typical or semi-typical colonies were further tested in lactose broth fermentation tubes. Morphology and staining were determined from agar slant. A straight wire dipping from the same colony was also stabbed into a lactose litmus agar tube holding about 12 cc. of the medium, to note whether disintegration due to gas production was violent or not. This is a point of some importance. The strains which were isolated during this work were found not to break up the media severely, — a characteristic attributed to true colon strains.

B. lactis aërogenes was isolated several times, occurring in almost pure culture, the significance of which could hardly be determined; in view of the fact that the number of waters examined was, indeed, limited and the time of my stay rather short. The organism was differentiated by its mucoid consistency of colony, strong acid production in lactose, yeast-like odor, absence of dye absorption which reduces the metallic lustre of the colony on Endo plate, and finally by its inability to break up dulcite and positive Voges-Proskauer reaction.

It seems that this portion of the south-eastern section of the United States may claim this organism frequently in its water.

Summary: Fifty-seven waters from a fairly safe source from the sanitary point of view have been tested as a routine procedure for the presence of *B. Coli*. 22.8 per cent positive tests have been obtained during a period of five months. A study of the table will show that while the average bacterial count has been quite low, as low as would be desired in a good water, the presence of the bacillus of the colon group has been detected not too infrequently. While any conclusion to be drawn from such a number of waters could hardly seem justified, it is evident, however, that the chlorination plant of the supply in question should be controlled and supervised by proper routine bacteriological examinations.

It is also suggested that such routine procedure of the water examination should constitute one of the features of the municipal laboratory. Records of such examinations on proper forms should be kept in a systematic way for study and reference.

NOTE. The writer desires to express his sincere thanks to Dr. G. McF. Mood, City Bacteriologist of Charleston, S. C., for his kind coöperation and assistance in placing the laboratory facilities at his disposal.

BACTERIOLOGICAL EXAMINATION OF SOFT DRINKS

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Bureau of Bacteriology of State and City Departments of Health, Baltimore, Md.

Read before Laboratory Section, American Public Health Association, at New Orleans, La., October 30, 1919.

Prohibition has boomed soft drinks so that more than ever there is need of rigid inspection. Dr. Stokes finds beverages with five-figure counts and empty "sterile" bottles always with some bacteria, sometimes with millions. This paper should attract the attention of health officers to their soft drink problems.

THE recent search for that evasive substance known as a ptomain has emphasized the fact that most of the cases of so-called ptomain poisoning are either due to bacterial infection or to such other causes as oxalic acid poisoning, over-eating, tartar emetic poisoning, acute and chronic nephritis and other similar conditions, as shown by the work of Rosenau* and his assistants.

These bacterial infections are usually produced by various members of the intermediate or hog cholera group such as the Alpha and Beta paratyphoid bacillus and *B. enteritidis. Proteus vulgaris,* an intestinal organism, can also produce intestinal disturbances, and all of these infections are due to the increase of the organisms in the intestine and definite infection at times accompanied by bacteremia with the presence of the organisms in the blood.

B. coli, a normal inhabitant of the intestine, seems to produce certain poisons in the foods before they are eaten, and the *B. botulinus,* a deadly anaërobic organism, also produces its soluble toxin in sausages, meat puddings and canned corn products when these materials have been subjected to inefficient sterilization. These two latter organisms do not produce direct infection by increase in the intestine but produce their poisonous products of metabolism in the food. When the food is consumed the poisons produce serious and even fatal intestinal diseases.

Owing to these facts the State Department of Health through Dr. Frederick C. Blanck, State Food and Drug Commissioner, instituted an examination of the various soft drinks which are being sold throughout the state. Many of these drinks were sold in large quantities at the various cantonments during the war, and this suggested an additional reason for their careful supervision. A great many of these drinks contain the various carbohydrates, and it is well known that the intestinal organisms develop favorably in such media, even splitting up the sugars into various gases and minute traces of alcohol.

Allen, LaBach, Pinnell and Brown,** of the Kentucky Agricultural Experiment Station, made a thorough investigation of the bacteriological condition of the various non-alcoholic, carbon-

*Med. Clinic of North America, Vol. 2, p. 1541.

**Bull. No. 192, June, 1915.

ated beverages sold in Kentucky. They also made a number of examinations of various materials involved in the processes of production. Their article contains a complete tabulated report upon a large number of examinations of these beverages as well as the city or filtered water used in the manufacture of the beverages, the rinse water used for the bottles, the water from caps, old caps, and the supposedly clean or sterile empty bottles before filling. The city waters examined showed counts ranging from 100,000 to 300,000 bacteria per cubic centimeter, the filtered water from 120,000 to 700,000 per c.c., the water used for rinsing bottles from 180,000 to 960,000 per c.c., the water off caps (one examination) 750,000 per c.c. old caps (one examination) 165,000 per c.c., and the clean or sterile empty bottles from 1,900 to 310,000 bacteria per c.c. The various beverages showed counts ranging from 10,000 to 850,000 bacteria per c.c.

Although the water used for manufacture very often showed a high bacterial count yet the products often showed very low bacterial counts, and they accounted for this result by the destructive or inhibitory effect of carbodioxide upon bacteria.

The unfiltered water contained a maximum *B. coli* count of 5,190 and a minimum of 0; the filtered water contained no colon bacilli. The rinse water showed a maximum of 106 and a minimum of 0; the empty bottles had a maximum of 1,440 and a minimum of 0 and the beverages showed a maximum *B. coli* count of 450 and a minimum of 0.

They believe that the bottles should be cleaned of all possible dirt by the proper kind of bottle washer and then sterilized with live steam for from 30 to 40 minutes, and the bottler should guard against any possible recontamination brought about by cooling with contaminated water. If filtered water be used the filter should be frequently examined in order to see that a pure filtrate is obtained, and it goes without saying that the water used should be free from colon bacilli and with a low bacterial count.

Our investigation is explained in detail in the following tables, the object of this investigation being to determine the number of bacteria present in the samples and to see whether any of these goods contained intestinal organisms. No special search was made for organisms other than the colon bacillus, the normal inhabitant of the intestine, but the presence of this organism in the fluids certainly suggests danger from the other pathogenic intestinal bacteria. The results which were obtained are set forth in detail in tables 1 and 2.

I am indebted to Mr. S. Caskey for much assistance in the routine examination of the above products named below. (See next page.)

CONSIDERATION OF RESULTS OBTAINED.

An examination of table No. 1 will show that in a number of instances the maximum count of these soft drink products was innumerable whilst other maximum counts show results of five figures. A large number of the samples also showed the presence of sugar-splitting or fermentative bacteria, as shown by positive presumptive tests in 10 cubic centimeters, 1 cubic centimeter and even 1/10 of a cubic centimeter. In the final attempt to isolate the colon bacillus, as expressed by the final test, it can be seen that we were often unable to isolate this organism, but the fermentation may have been produced by yeasts, the lactose splitting aërobic spore-bearing organisms recently isolated from water, the anaërobic spore-bearing organisms, or other aërobic gas producing bacteria. In many instances we were unable to obtain any colonies from the plates

examined, but no special attempt was made to isolate other organisms besides the colon bacillus.

We tested out a number of empty bottles for sterility and found a maximum count of innumerable and a minimum count of 500 bacteria per bottle. Colon bacilli were isolated in a number of samples even in as small a quantity as 1/10 of a cubic centimeter. This is an interesting point, since it may be that improperly sterilized bottles are often a cause of the bacterial contamination of the soft drinks, and we

TABLE No. 1

TABLE OF SOFT DRINKS SHOWING BACTERIAL COUNTS AND COLON TESTS

Flavor	Bacterial Count 37°		No. Exam.	Colon Examinations Presumptive Test			Final Test		
	Max.	Min.		10 cc.	1 cc.	0.1 cc.	10 cc.	1 cc.	0.1 cc.
Ginger Ale	In.*	0	92	43	22	1	17	8	0
Lemon	In.	0	83	41	13	0	10	4	0
Sarsaparilla	In.	0	83	40	26	4	16	14	3
Orange	2,800	0	42	19	11	3	4	2	0
Strawberry	In.	0	44	24	17	5	12	8	3
Root Beer	350	0	14	3	2	0	2	2	0
Birch Beer	20,000	0	7	3	3	1	0	0	0
Vanilla Soda	450	5	6	4	2	0	2	2	0
Chocolate	In.	0	10	3	3	0	0	0	0
Grape	38	0	8	3	3	0	0	0	0
Coca Cola	600	3	6	4	2	0	0	0	0
Champagone	275	0	8	2	2	2	0	2	2
Raspberry	3,200	20	6	4	0	0	1	0	0
Miscellaneous	38,000	0	47	8	5	0	4	3	0
EMPTY BOTTLES FOR STERILITY									
Bottles	Per Bottle In.	500	26	17	12	8	15	12	8

*In. indicates Innumerable.

TABLE No. 2

TABLE OF SOFT DRINKS SHOWING NUMBER OF BACTERIAL COUNTS ACCORDING TO GROUPS

	0	1-50	51-100	101-250	251-500	501-1000	1001-5000	50001-10000	10001-20000	20001-50000	Innumerable
Ginger Ale	8	54	7	4	4	4	8	1	0	0	2
Lemon	10	47	5	4	2	4	10	0	0	0	1
Sarsaparilla	10	26	12	3	4	7	8	5	0	0	5
Orange	10	23	3	2	2	0	2	0	0	0	0
Strawberry	6	23	5	1	1	0	3	3	0	0	2
Root Beer	5	7	0	0	1	0	0	0	0	0	0
Birch Beer	2	2	0	0	0	0	0	1	1	1	0
Vanilla	0	2	1	1	1	0	0	0	0	0	0
Chocolate	3	2	0	1	0	0	1	0	0	0	3
Grape	2	6	0	0	0	0	0	0	0	0	0
Coca Cola	0	4	0	0	0	1	0	0	0	0	0
Champagone	2	3	0	1	1	0	0	0	0	0	0
Raspberry	0	0	2	3	0	0	1	0	0	0	0
Miscellaneous	15	17	6	5	2	0	1	0	0	1	0

EMPTY BOTTLES FOR STERILITY

Bacterial Count Per Bottle

	1-500	501-1000	1,001-50,000	50,001-1000,000	100,001-250,000	250,001-500,000	500,001-1 mil.	1 m.-5 m.	5 m.-20 m.	In.*
Bottles	1	1	2	1	2	2	5	3	2	2

*In. indicates Innumerable.

usually found a small amount of fluid in the bottom of the bottles. Even a few bacteria remaining after sterilization might increase in this fluid and thus produce the high bacterial counts often obtained from the washings from the bottles. These bottles were washed out with 100 cubic centimeters of sterile water and the dilutions were made from such an amount.

An examination of table No 2 will show the bacterial counts arranged according to groups between certain fixed limits. A certain number of the soft drinks tested, therefore, showed no bacteria present; others showed bacteria varying between a count of 1 to 50, and these groups are continued to as high a limit as from 20,000 to 50,000, A few of the plates showed innumerable colonies and could not therefore be estimated.

An examination of the bacterial counts for sterility shows that some of the bottles contained millions of bacteria per bottle, and, as mentioned before, this is probably explained by the great increase which may take place in the small amount of water often left in the bottle after sterilization.

CONCLUSIONS

1. Many soft drinks contain variable numbers of bacteria and this large bacterial content may be partially explained by the improper sterilization of bottles.

2. A few bacteria remaining in the bottles may increase in the small quantity of water often left in the bottles after sterilization. Dust organisms getting into the bottles may also resist sterilization even if the bottles are properly dried.

This matter may be of some importance in relation to the possibility of intestinal infection, since the organisms which produce so-called food poisoning often find a favorable culture medium in the carbo-hydrates of these soft drinks.

□

Poland 200 Years Behind in Therapy.—The native doctors in Poland are using the drawing of blood for their principal curative method, just as was the custom generally a couple of hundred years ago. In just the same way these doctors usually combine the profession of the barber with that of "leech," just as in the olden time, and indeed the striped barber's pole is merely a sign of the blood-letting capacity of this artificer when the sign was invented. And just as these men applied leeches for the purpose, whereby the name of the worm became a synonym for the practicer of medicine, so their modern disciples in Poland have been in the habit of using the leech. If the man got well the barber-doctor had made a miraculous cure; if he died, it was but the will of God.

Recently this ancient system of practice has been violently overthrown. American Red Cross doctors and nurses came into the district and found typhus and many other diseases flourishing, with no medical attention except that which the barber could bestow. An American hospital with all modern medicines and equipment was installed and the barbers soon lost the medical and surgical end of their practice. Their aid was enlisted, however, in closely shaving be-whiskered men and clipping short the hair of those who were infested with vermin. Just now, after weeks of strenuous medical campaigning, headway is being made against the disease which the barbers' leeches had so long failed to cure. Leech-craft has gone out of Poland.

TREATMENT OF BEET SUGAR PLANT SEWAGE

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Read before Sanitary Engineering Section, American Public Health Association, at New Orleans, La., October 28, 1919.

Beet sugar is an industry yearly attaining greater and greater importance. Likewise the disposal of the wastes is a problem of increasing consequence in various sections of the country. This paper and the discussions constitute an unusual assembling of the facts, valuable to local authorities and those commercially interested, alike.

1. INDUSTRIAL SEWAGE PROBLEM.

THE treatment or disposal of industrial sewages is constantly assuming greater importance in this country. The location of industries is determined, among other factors, by the proximity of raw materials and the availability of transportation. Plant locations have quite generally been determined from these factors rather than on the disposal of the sewage. In some instances, an ample supply of water is an important element. Thus, industries which require large amounts of water and which in turn produce considerable volumes of sewage are frequently located close to rivers or streams. In many instances, particularly in the middle west, the streams at certain seasons of the year do not have sufficient flow to carry away without nuisance the sewage discharged into them from the manufacturing processes. As the population adjacent to rivers increases and as sanitary standards develop, public attention is directed toward the prevention of stream pollution, and thus to the treatment of industrial sewage. In this way, problems of sewage treatment, not contemplated in the original design of a manufacturing plant, have been forced to the attention of the plant managers.

2. THE BEET SUGAR PLANT INDUSTRY.

The manufacture of sugar from beets is an industry firmly established in this country, particularly throughout the Mississippi Valley. In 1917 there were, all told, about 96 beet sugar plants in this country, which handled 5,919,673 tons of beets with a production of sugar of 820,657 tons. A production of beet sugar in this country in 1901 of 184,606 tons had increased in 1917 to 820,657 tons. In 1917 the total acreage planted to beets was 865,308.

The process of making the sugar from beets is quite complicated, a diagrammatic outline of it being shown in Figure 1. The beets are delivered from freight cars and teams into large storage bins, from which they are generally carried by water in flumes to the plant. The flow of water is in sufficient quantity to carry the beets through proper devices so that beet tops, earth and dirt are washed away. The clean beets are then cut into cossettes, which are carried by conveyors through the various plant processes. It is roughly estimated that from 100 tons of beets handled, the following approximate quantities are produced: Dry pulp, 5 tons; sand, dirt, grit, etc., 3 to 4 tons; sugar, 12.5 to 13 tons; and water, 70 tons. The loss due to improper cutting and topping is 3 to 4 tons.

3. SOURCES OF SEWAGE.

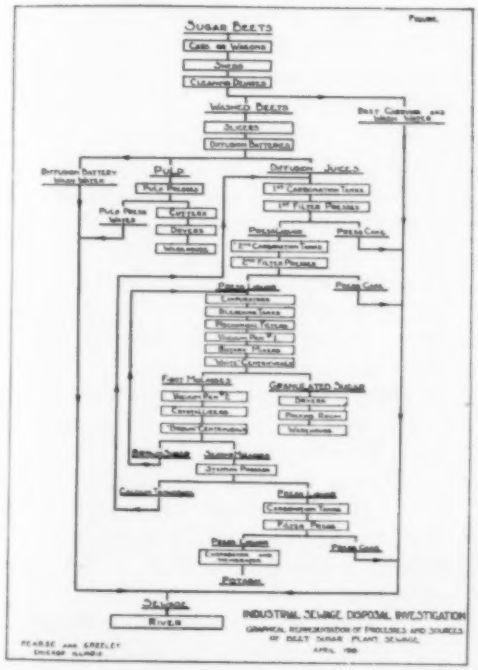
The principal sources of sewage in a beet sugar plant are the following:

a. The wastes from the flumes and beet washing processes which contain earthy materials mixed with beet roots and tops.

b. Water used in flushing out the diffusion cells. This is found to amount to about 110 per cent by weight of the beets sliced. This waste contains from 0.1 to 0.5 per cent of sugar in solution in addition to other organic compounds from the beet cells.

c. Press water from the pulp presses. This is stated to amount to about 67 per cent by weight of the beets sliced.

d. Waste water used in washing the filter presses which carries away the press cake to the sewers. This waste contains the precipitated calcium carbonate ($Ca\ Co_3$) which is estimated at 50 tons of dry matter per 24 hours per 1,000 tons of beets.



e. Water from the condensers which is used in the flumes for carrying the beets.

The beet carrying and washing waters are the largest by volume, but contain the least amount of organic matter. They contain a great amount of inorganic, earthy material, which varies largely from day to day, ranging from 2 to 20 per cent by weight of the beets. The sewages which are strongest in organic matter are those from the diffusion batteries and the pulp presses, and the waste containing the press cake.

4. QUANTITY OF SEWAGE.

The quantity of sewage from these various sources varies considerably from day to day, but bears an approximate relation to the quantity of beets sliced. The hourly variation is quite marked, ranging from 50 to 150 per cent of the average.

A summary of the total sewage from several beet sugar plants is given in Table *1*.

TABLE 1

THE TREATMENT OF BEET SUGAR PLANT SEWAGE—QUANTITY OF TOTAL SEWAGE

Plant	Gallons per 24 hours per 1000 tons of beets sliced
Holland-St. Louis Sugar Co.	
Holland, Mich., 1918	3,340,000
Decatur, Ind., 1917	3,640,000
1918	3,250,000
Caro, Michigan	4,070,000

5. CHARACTERISTICS OF THE SEWAGE.

The sewage from a beet sugar plant may be divided for study purposes into two classes, (1) the wastes from the diffusion batteries and pulp presses, and (2) the wastes from all other sources. The first class are the stronger in organic matter and the smaller in volume. The term "crude sewage" as used in this paper refers to the mixed sewage from the diffusion batteries and pulp presses. In appearance it is gray in color with a sweet musty odor, similar to that of cooked beets. It is distinctly turbid, containing bits of beet pulp. A summary of the analyses of this sewage compared with other industrial sewages is given in Table *2*.

Several special characteristics of beet sugar plant sewage appear from the data in Table *2*. The oxygen consumed is

comparatively high, whereas the total organic nitrogen is low. Of a very large content of total solids (6,112 p. p. m.) only 974 p. p. m. appear as suspended matter. Thus a very large proportion of the organic matter is in solution. In addition, the sewage is strongly acid. The sewage most nearly resembling beet sugar plant sewage is that from a starch factory.

6. REVIEW OF EXPERIENCE.

The beet sugar plants are located mostly in the United States and throughout the north central part of Europe. Thus the principal source of information relative to the sewage treatment problem is found in German and American literature, with some references in the French technical journals.

During the winter of 1910, T. S. Ainge, of the Michigan State Board of Health, made a special trip through Germany to investigate treatment of beet sugar plant sewage. He summarized the situation in Germany as follows:

"A general plan for the sanitary disposal of the liquid wastes from beet sugar factories has not been worked out in Germany.

"Some years ago, Herr Von Boettcher, Ober-President of the Province of Saxony, tried to govern the disposal of the wastes from beet sugar factories by means of general regulations but found the plan impracticable.

"While some of the settling basins and other places into and through which the liquid wastes from the beet sugar factories flow, smell quite badly at times, very few complaints are received and that, in dealing with such complaints, owing to the importance of the industry, the Government officials act with the utmost conservatism so as not to unduly hamper the industry.

"Sugar factory owners are not permitted to allow the beet pulp to accumulate upon their premises, and must dry or remove the same, or arrange for its removal, as fast as it is produced. This rule is rigidly enforced."

The authors' search through German literature does not reveal anything more conclusive as having developed during the few years following 1910. At some of the plants where fresh water is scarce, the wastes are retained in large settling tanks and used repeatedly in the plant processes. At other plants, the sewage is first settled in large ponds and then treated on underdrained fields. At one plant the crude sewage from the diffusion batteries and pulp presses is treated in large settling tanks with lime, the effluent being further treated in underdrained fields. At Schofstadt, the sewage from 660 tons of beets per 24 hours is treated in this way, the area of the field being 12.6 acres.

Calmette, Director of the Pasteur Institute, Lille, France, states that if the diffusion battery sewage is diluted with about an equal volume of beet-carrying water, and then screened and settled, it can be treated on sprinkling filters at the rate of 1.07 million gallons per 24 hours, and a non-putrescible effluent produced. The writers' experience indicates that dilution with the beet carrying water is very helpful, as suggested here. In the United States the principal development has been at the sugar plants in the use of settling ponds.

7. CARO, MICHIGAN, DATA.

An opportunity to inspect the sewage treatment plant of the beet sugar factory at Caro, Mich., was afforded the writers by Frank Sielands, superintendent. This plant was first built in 1911 and has been subsequently enlarged from time to time. A general plan is shown in Fig. 2. There are 3 settling ponds.

The sewage flows through the settling ponds and thence onto underdrained sandy areas totaling 16.2 acres. The first installation of sand filter units covered only 8.9 acres which was found to be very much too small so that the soil clogged. The second filter of 7.4 acres was then added.

The total sewage flow is estimated at 3.25 million gallons per 24 hours. On this basis the displacement period in the three settling ponds at 2.0 feet liquid depth is about 3 days and 15 hours. The rate on the first sand filter built is about 365,000 gallons per acre per day. The net rate on both sand filters together is about 200,000 gallons per acre per day. This rate is stated to give a satisfactory effluent.

8. TESTING STATION.

The problem of sewage treatment being active at the Decatur plant of the Holland-St. Louis Sugar Co., it was concluded that sufficient information was not available for the design of a plant, and as no local sandy areas were available it was decided to build a testing station, Fig. 3, to study out other methods of treatment. The tests were run on crude sewage from the diffusion batteries and pulp presses. The testing station included the following apparatus:

a. A small cylindrical screen 2 feet in diameter and 4 feet long, supporting a fine screen with 30 meshes per lineal inch. Water was sprayed from a perforated pipe on to the outside of the screen near the top. The screen was operated at 8 r. p. m. The screenings were removed by a screw conveyor inside.

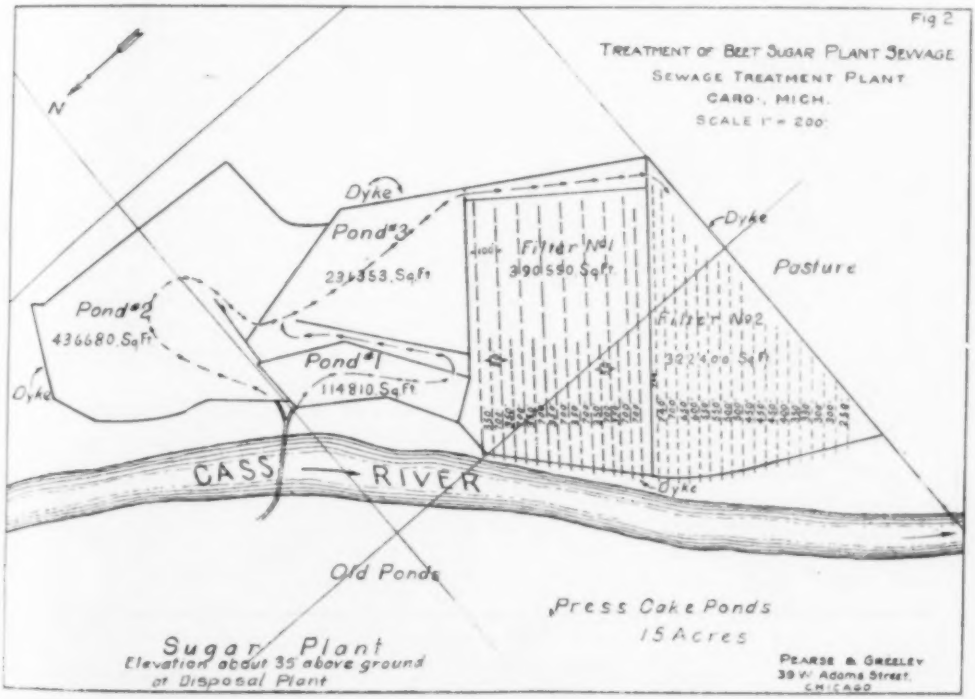
b. Two settling tanks were built, each of 2-inch staves, 10 feet long and 8 feet in diameter. The bottoms were formed inside with lean concrete to a 45 degree slope. The sewage entered at the center at a level with the top of the hopper bottom and flowed upward and outward to a gutter around the circumference of the tank. The capacity of each sludge compartment was 450 gallons.

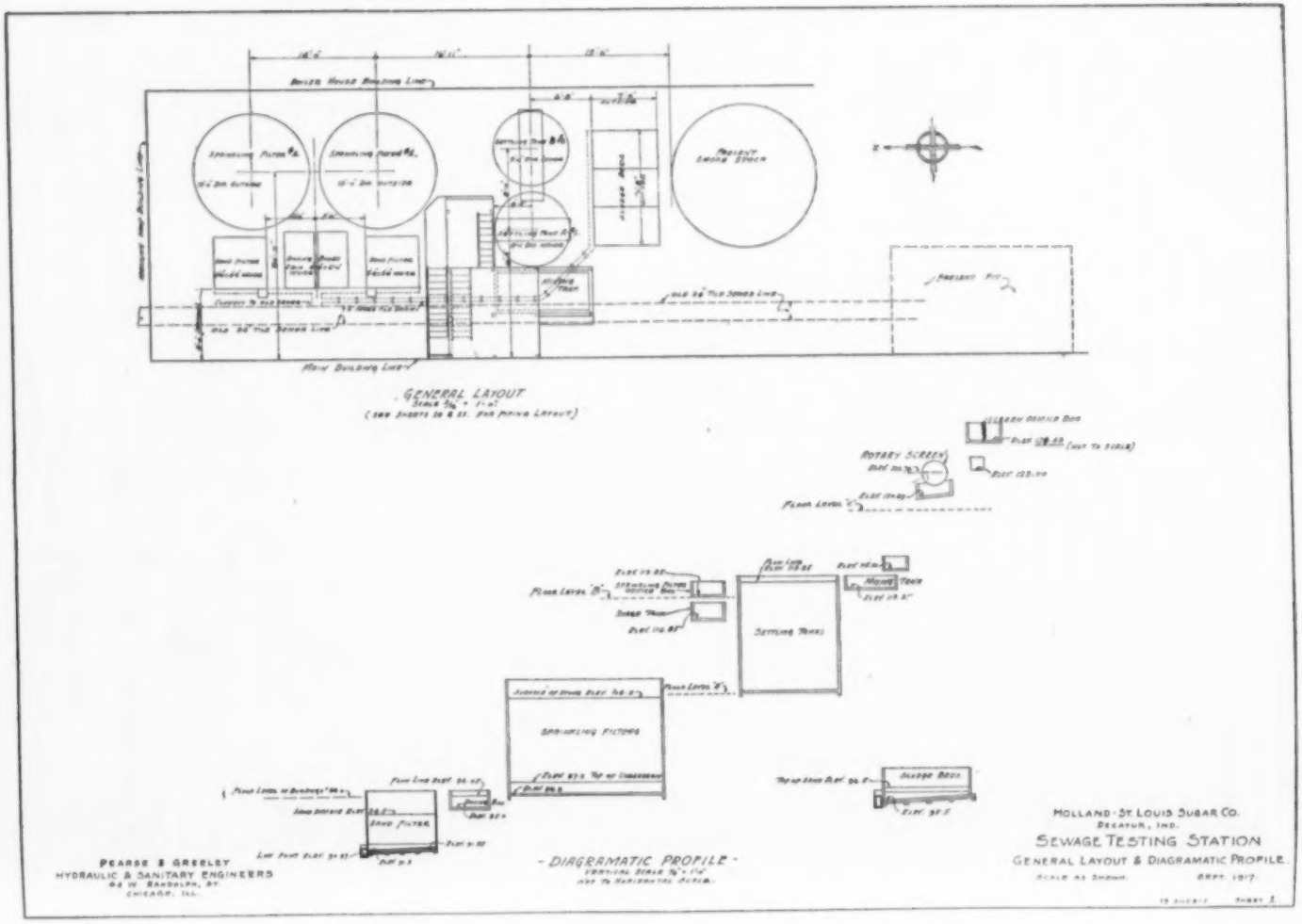
c. There were 2 sludge beds, each 7x4 feet. These were underdrained and contained 6 to 9 inches of graded gravel, on which was placed 3 inches of medium sand.

d. An apparatus was provided for adding milk of lime and there was a wooden mixing box 9.5x4 feet, containing 6 channels, through which the screened sewage and lime flowed at a rapid velocity.

e. There were two sprinkling filters, each of 2-inch staves, 10 feet long and 13 feet outside diameter. On top of an underdrain system was placed 7.5 feet of broken stone, ranging in size from 1¼ to 2¼ inches. At the center of each filter was a nozzle of the Worcester type.

f. Two sand filters, each 5 feet 10




BOILER HOUSE BUILDING LINE
SPRINKLING FILTER No. 2
SPRINKLING FILTER No. 1
SETTLING TANK No. 2
SETTLING TANK No. 1
PRESENT SLUDGE STOCK
OLD 36" TILE SEWER LINE
PRESENT PIT
MAIN BUILDING LINE
GENERAL LAYOUT
(SEE SHEETS 10 & 11 FOR PIPING LAYOUT)
ROTARY SCREEN
FLOOR LEVEL
SETTLING TANKS
SPRINKLING FILTERS
SURFACE OF STONE
SAND FILTER
SLUDGE BEDS
- DIAGRAMMATIC PROFILE -
PEARSE & GREELEY
HYDRAULIC & SANITARY ENGINEERS
MOLLAND-ST. LOUIS SUGAR CO.
DECATUR, IND.
SEWAGE TESTING STATION
GENERAL LAYOUT & DIAGRAMATIC PROFILE.
SCALE AS SHOWN. SEPT. 1917.

inches square, were built of wood. Each sand filter contained a sloping false bottom supporting 3 to 6 inches of gravel and 2 feet 6 inches of sand. Each filter was provided with a dosing tank operated by hand, as the dose was applied only once or twice during 24 hours.

g. The usual orifice boxes, dosing apparatus and other accessories were included.

TABLE 2

TREATMENT OF BEET SUGAR PLANT SEWAGE—ANALYSES OF CRUDE SEWAGE P. P. M.

Sewage	Solids		Total Organic N	Biological Oxygen consumed	Oxygen consumed	Alkalinity as Ca CO_3	Acidity
	Total	Suspended					
1. Beet sugar plant	12456	974	37.2	1000	1276	.....	302
2. Beet sugar plant	12456	10007	50.0	.....	119	29	.....
3. Beet sugar plant	2065	.....	.....	.....	1850	.....	.....
4. Starch works	5000	1500	138.7	1600	1000	.....	.....
5. Tannery	.....	4000	30.0	.....	.....	233	.....
6. Packing house	5574	808	85.0	.....	440	.....	.....
7. Center Ave., Chicago	.....	605	79.0	990	268	291	.....

Notes: 1—Diffusion battery and pulp press sewage, Decatur, Ind.
2—Total sewage, Decatur, Ind.
3—Diffusion battery sewage, Caro, Mich.

TABLE 2a

TREATMENT OF BEET SUGAR PLANT SEWAGE
GROSS AND NET YIELD OF VARIOUS DEVICES 1917

Device	Gross rate gallons per 24 hours	Average hours of operation per 24 hours	Number days operated	Net yield gallons per 24 hours	Average Detention period hours
Revolving screen	75,000	16.0	52	36,400	.....
Settling tank A_2					
Plain sedimentation	16,100	15.7	17	10,640	4.2
Chemical sedimentation	13,800	15.0	21	8,620	5.1
Settling tank B_2					
Plain sedimentation	13,800	16.2	59	9,300	4.8
Sprinkling filter A_3					
Plain sedimentation	782,000[1]	17.8	17	581,000[1]	.....
Chemical sedimentation	782,000[1]	17.8	21	581,000[1]	.....
Sprinkling filter B_3					
Plain sedimentation	782,000[1]	18.9	59	617,500[1]	.....

[1] Gallons per acre per day.

TABLE 2b

HOLLAND-ST. LOUIS SUGAR CO.
INDUSTRIAL WASTE DISPOSAL INVESTIGATION GROSS AND NET YIELDS OF VARIOUS DEVICES 1918

Device	Period	Gross rate gallons per 24 hours	Average hours of operation per 24 hours	Number of days operated	Net Yields	
					Gallons per 24 hours	Average detention period hours
Revolving screen	.....	75,000	19.5[5]–22.9[6]	71½[5]–54½[6]	.....	.....
Settling tank A_2	.....	20,000	17 –22.9	41 –23	.....	3.65[5]–2.779[6]
Settling tank B_2	.....	19,000	19.3 –22.9	71½ –54½	.....	3.21 –2.77
Sprinkling filter A_3	to Nov. 3	550,000[1]	12	13	275,000[1]	.....
	to Nov. 26	550,000[1]	23.1	23	531,000[1]	.....
Sprinkling filter B_2	to Nov. 3	550,000[1]	12	13	275,000[1]	.....
	to Nov. 23	550,000[1]	23.2	20½	537,000[1]	.....
	to Dec. 11	245,000[1]	22.7[3]	18 [4]	240,000[1 2]	.....
	to Dec. 27	168,000[1]	23.0	14½	160,000	.....
Sand filter A_4	to Dec. 25	92,000[1]	24	18	92,000	.....
Sand filter B_4 (2)	to Dec. 27	92,000[1]	23½	50	90,000	.....

Notes: [1] Gallons per acre per 24 hours. [2] Sand filter B_4 was operated on Nov. 26 and Dec. 5 at 46,000 gallons per acre per 24 hours. [3] Does not include period of overdosing. [4] Includes overdosing time. [5]Rate computed for total period of operation. [6]Rate computed for period after Nov. 3rd.

Although this testing station has been operated for two campaigns, the shortness of the campaigns made it necessary to supplement the large scale tests with some smaller tests made in 4-inch tin tubes as described later. The gross and net yield of the various devices are shown in Tables 2a and 2b for the 1917 and 1918 work respectively.

9. FINE SCREEN.

The operation of the fine screen was very successful. The results of operation are shown in Table 3. The screenings were mostly small pieces of beet pulp having a somewhat slippery surface, so that cleaning the screen was easy. During the 1917 period, no attempt was made to limit the amount of wash water or determine its quantity. In 1918 it was found that almost no wash water was required. The screenings did not become offensive for several days and were returned to the plant for manufacture into cattle food.

10. SEDIMENTATION.

During the 1918 tests, one settling tank was operated as a plain settling tank, and the other as a chemical precipitation tank, using lime. It was soon found that excessive foaming occurred in the plain settling tank and during the 1918 tests, lime was added to both tanks as shown in Table 4. The results of sedimentation are shown in Table 4 (a). With the use of lime, it is estimated that upwards of 60 per cent of the suspended matter can be removed. The reduction in B. O. C. is indicated at 50 to 70 per cent. These determinations were somewhat irregular, however, and methylene blue tests indicated that the settling tank effluents would not stand for over a few hours. The oxygen consumed test, indicating less than 30 per cent reduction, is a better index.

Sludge data are shown in Table 5. The amount and character of the sludge varied with the amount of lime added.

TABLE 3

THE TREATMENT OF BEET SUGAR PLANT SEWAGE—RESULTS OF FINE SCREENING

Sewage	Year	Screenings, Pounds per mil. gallons		Percent moisture in screenings	Wash water percent of sewage screened	Rate of screenings gallons per Sq. Ft. per 24 hours	Percent removal of suspended matter p. p. m.
		Wet	Dry				
Beet Sugar Plant							
(1) Testing station	1917	14300	786	94.5	10.1	5700	12.0
	1918	11960	578	95.2	0.1	5700	6.3
(2) Anaheim, Cal.	1913	33500	.....	.....	.....	.....	11.3
(1) Stock Yards, Chicago	1913	7300	950	86.4	4.1	4000 to 8000	17.0

Notes: (1) 30 mesh screen.
(2) 40 mesh screen.

TABLE 4

THE TREATMENT OF BEET SUGAR PLANT SEWAGE
RESULTS OF SEDIMENTATION

Description	Detention period	Lime added grains per gallon	Percent reduction over applied liquor		B. O. C.
	Hour		Suspended matter	Oxygen consumed	
1917					
Plain settling	3.2	None	44.0	28.0	.....
Lime settling	3.2	70	35.0	14.0	.....
1918					
Lime settling	2.79	153	71.0	.....	50.0-70.0
Lime settling	2.79	34	69.0	.....	70.0

It flowed readily out of the tanks into the sludge beds and dried to a spadeable condition within two weeks in autumn weather.

11. SPRINKLING FILTERS.

Dosing sprinkling filters at the rate of 500,000 gallons per acre per 24 hours or more was very much too high. When the rate was reduced to 168,000 gallons per acre per 24 hours, a very much better effluent resulted. The B. O. C. was reduced from 1,000 p. p. m. in the crude sewage to 282 p. p. m. in its effluent. The effluent took from 11.9 to 40.9 hours to decolorize methylene blue. The effluent contained about 30.1 per cent dissolved oxygen. The suspended matter in the effluent was reduced to about 40.0 p. p. m.

TABLE 4
TREATMENT OF BEET SUGAR PLANT SEWAGE
RATE OF APPLICATION OF LIME 1918 TESTS

Week ending, 1918	Lime added, Grains per gallon	
	Tank A	Tank B
Nov. 9	254	37
16	160	35
23	110	30
30	90	34
Dec. 7	...	26
14	...	44
21	...	28
28	...	35
Ave. 1918	153	34
1917	70	

required an average of 24.8 hours to decolorize methylene blue. Several samples stood for from 60 to 204 hours, averaging for the period, December 8th to 21st, 35.5 hours.

13. SMALL SAND FILTER TESTS.

An attempt was made during the 1918 tests to operate half the testing station with a mixture of the beet carrying and wash water. This could not be worked out within the time available, so that tests were made of the mixed sewage on sand filters contained in 4-inch tin tubes.

These filters comprised gravel supporting 30 inches of medium sized sand with a drip cock at the bottom of the tubes. They were dosed with varying liquids after quiescent settling at the rates shown in Table *6*. The effluent of the filter receiving a "one to one" mixture was as satisfactory as that receiving a "one to three" mixture. In both cases it required upwards of 100 hours to decolorize methylene blue with a rate of operation of 100,000 gallons per acre per 24 hours.

14. SUMMARY.

A summary of the results of the two-year tests is given in Table *7*. It would have been desirable to make further tests with a mixture of the diffusion battery and pulp press sewage and an equal

TABLE 5
TREATMENT OF BEET SUGAR PLANT SEWAGE
SLUDGE DATA

Kind of settling	Lime added average grains per gallon	Sludge cu. yds. per million gallons	Moisture contents percent	Percentage calculated to dry weight	
				Volatile matter	Mixed solids
1917 Plain	0	1.7	94.3	48.7	51.3
Lime	70	53.1	91.7	38.2	61.7
1918 Lime	153	109.9	86.4	20.4	79.6
	34	72.9	90.7	31.1	68.9

12. SAND FILTERS.

The sand filters were not operated during 1917, but during the 1918 tests they were dosed with sprinkling filter effluent at an average rate of 92,000 gallons per acre per 24 hours. The tests did not indicate any marked reduction in B. O. C. over the sprinkling filter, but it

volume of beet carrying water. A review of the evidence, and the results of the tests, however, indicated certain loadings as likely to work out in practice. Fine screenings and sedimentation are indicated as necessary for any type of treatment plant. The effluent of the settling tanks can be treated on sprinkling

TABLE 6
TREATMENT OF BEET SUGAR PLANT SEWAGE
SUMMARY OF RESULTS OF OPERATION OF 4-INCH SAND FILTER

Period ending 1918	Rate gallons per acre per 24 hours	Crude Sewage			Rate gallons per acre per 24 hours	1 crude to 1 pond effluent			1 crude to 3 pond effluent		
		D. O. % Sat.	B. O. C.	Hours to decolorize		D. O. % Sat.	B. O. C.	Hours to decolorize	D. O. % Sat.	B. O. C.	Hours to decolorize
Dec. 7	150,000	.....	.....	35	150,000	.....	.....	40	.....	.....	40
11	150,000	.....	40	30	150,000	.....	20	52	.....	20	57
14	50,000	.....	830	55	100,000	.....	330	38	.....	330	45
15	50,000	.....	.....	69	100,000	.....	.....	.....	.....	.....	.....
21	25,000	3.9	301	75	100,000	9.5	159	100	.....	185	59
28	25,000	.....	.....	134	100,000	17.2	129	114	.....	80	157
31	25,000	.....	.....	228	100,000	40.3	20	240	.....	20	180

Note: Figures are weekly averages of daily samples of effluents of sand filters dosed with liquors indicated.

TABLE 7
TREATMENT OF BEET SUGAR PLANT SEWAGE
TYPICAL ANALYSES OF EFFLUENTS OF VARIOUS PROCESSES. p. p. m.

Sewage and year	Suspended matter	Oxygen consumed	Biological Oxygen consumed	Acidity	Alkalinity	Hours to decolorize methylene Blue	Notes
1917 Crude	976	1276	.....	302	.....	.....	.....
Screened	862	992	.....	414	.....	.....	
Plain settling	487	717	.....	419	.....	.....	
Lime settling	469	787	.....	165	275	.....	
Spk. filter	125	302	.....	71	.....	4.5	581,000 g.p.a.d.
Sand Filter	.....	.....	.....	.....	.....	.....	
1918 Crude	1095	.....	1000	249	.....	.....	
Screened	1026	.....	.....	.....	.....	.....	
Lime settling	319	.....	351	177	380	.....	
Sprinking filter	145	.....	285	290	.....	.....	168,000 g.p.a.d.
Sand filter	88	.....	282	116	.....	24.8	92,000 g.p.a.d.

filters. Our conclusions from the tests and data were, that sprinkling filters for the crude concentrated sewage could be dosed at about 200,000 gallons per acre per 24 hours, and sand filters at about 75,000 gallons per acre per 24 hours.

Should the concentrated sewage be mixed with an equal volume of beet-carrying water, the data indicate that a settled effluent could be treated on sand filters dosed at the rate of 100,000 gallons per acre per 24 hours.

These rates of filtration result in quite costly installations, and every effort should be made to keep the cost down by utilizing local conditions of stream flow and soil to the utmost. These results are not wholly conclusive, but indicate the great difficulty of treating beet sugar plant sewage.

DISCUSSION

Discussion of the foregoing paper on "Treatment of Beet Sugar Plant Sewage" by *W. H. Dittoe,* Chief Engineer, Ohio State Department of Health.

Mr. Dittoe noted that the paper just presented gave much valuable information not before available. He cited an experience in Ohio with the problem.

In 1910, a beet sugar plant with a capacity to handle 900 tons of raw beets per day was constructed at Paulding, Ohio. This plant is located immediately upstream from the village on Flatrock Creek, a stream draining 80 square miles, and having a low discharge during the dry months of the year, which, during extreme low flow, is entirely diverted to the plant for water supply. When operating at capacity, the plant produces from 2,500,000 to 3,000,000 gallons of wastes per day, which, in addition to the typical beet sugar plant wastes, contain also wastes from the Steffens process. This process is a method of handling the molasses or mother liquor coming from

the centrifugal machines, by which the sugar is extracted and returned to the main plant processes. The wastes from the Steffens process are very concentrated, one catch sample showing in parts per million 7,800 parts oxygen consumed, 19,000 parts total organic solids, and 13,000 parts of alkalinity. These wastes have a volume of 150,000 to 200,000 gallons per day and appreciably increase the concentration of the wastes from the plant as a whole.

When the plant was constructed, an attempt was made to improve the character of the wastes, as follows: (1) A settling pond was provided for the clarification of about one-third of the water used for beet transportation and washing, the settled water being used again; (2) A settling pond was installed to receive the heavy lime cake wastes from the presses and also the Steffens waste, the overflow entering the main sewer of the plant conveying all other wastes; and, (3) A settling pond of 300,000 gallons capacity was provided for the combined wastes of the plant conveyed by the main sewer, the overflow being discharged into Flatrock Creek. This method of modification of the wastes was not efficient, due partly to the small capacity of the final settling pond and a serious nuisance was created in the creek which was the cause of much complaint during the campaigns of 1910, 1911 and 1912. An examination of the stream in December, 1912, showed the creek to be grossly polluted for several miles below the plant. Heavy sludge deposits, marked discoloration, and odors were noted. The following is an analysis of a catch sample of the effluent of the final settling basin at the point of discharge into the creek.

Determination	Parts Per Million
Turbidity	1,500
Oxygen consumed	1,688
Kjeldahl nitrogen	182
Alkalinity (filtered)	296
Total Calcium	2,402
Suspended solids—	
Total	9,647
Loss on ignition	1,254
Dissolved solids—	
Total	2,569
Loss on ignition	1,539

It is not surprising that such an effluent would cause a nuisance in a small stream.

In 1913, an attempt was made by the manager of the plant to improve conditions through coagulating the combined wastes by the use of sulphate of iron and enlarging somewhat the final settling pond capacity. This was found to improve the character of the effluent to some extent and the method was continued in use in 1914 and 1915. The removal of suspended solids was satisfactory until the settling basin filled with sludge, but no beneficial effect upon the dissolved organic solids resulted. Owing to the rapid filling of the settling pond with deposits, continued efficiency in clarification was not secured. In 1915, an examination of the creek showed foul conditions and heavy sludge deposits. In February, 1916, the State Board of Health ordered the company to improve conditions, and before the 1916 campaign the company made extensive improvements for the treatment of its wastes. These improvements, which were designed for a flow of 3 m. g. d., consisted of a mechanical screen, equipment for application of solutions of lime and sulphate of iron, and enlarged settling basins. The screen is a 12-foot drum screen, manufactured by the Sanitation Corporation, and is driven by a 5 h. p. motor at a speed of 2 r. p. m. It has bronze plates with V slots 5/64-inch wide and is cleaned by revolving brushes assisted by water sprays. The chemical treatment used in 1916 corresponded to 13 grains per gallon of lime and 2 grains per gallon of iron. After treatment, the wastes enter a pump well and about one-third of the flow is pumped to basins having a holding capacity of 3,800,000 gallons, or 3.8 days' flow. The effluent from these basins is used as a water supply for transporting beets. The remaining two-thirds of the flow passes to the main sewer, into which is also discharged the overflow from the basin receiving the Steffens waste and the lime cake from the presses. These wastes are kept separate from the general plant wastes up to this point to avoid the deleterious effect upon the water supply of the plant which would result. The mingled wastes in the main sewer then pass to a settling basin of 1,800,000 gallons' capacity, or 22 hours' retention, and the effluent from this basin is discharged into the creek.

The operation of these treatment pro-

cesses was observed in November, 1916, and November, 1917. It was found that the effluent of the final basin was very dark in color. The creek was discolored but no sludge deposits or offensive odors were noted. The following is an analysis of a sample of the effluent of the final basin collected in November, 1916:

Determination	Parts Per Million
Kjeldahl nitrogen	66
Oxygen consumed	370
Alkalinity	386
Total suspended solids ..	122
Dissolved solids—	
Total	1,920
Loss on ignition	995

This analysis indicates a satisfactory removal of suspended solids but a high content of dissolved organic matter. During the 1916 campaign, the screen removed 2.5 tons of screenings per 24 hours, and the final settling pond retained approximately 4,000 cubic yards of sludge, filling it about half full. It is worthy of note that no complaints have been received by the State Department of Health since these improvements were installed.

The experience in the treatment of the wastes of the Paulding plant has demonstrated that efficient clarification can be secured by chemical precipitation and sedimentation, which treatment, however, does not accomplish a beneficial change with reference to the dissolved organic impurities in the wastes. Obviously, oxydizing processes would be required to accomplish this and a large expenditure would be involved. It does not appear that such expenditure would be justified unless it could be shown that public health is involved or that the rights of riparian owners demand more complete treatment. The absence of complaints from riparian owners would seem to indicate that the treatment processes used at the Paulding plant have accomplished sufficient improvement to meet the demands of property owners affected.

DISCUSSION (CONTINUED)

Discussion of the foregoing paper on "Treatment of Beet Sugar Plant Sewage" by *Robert Spurr Weston,* Boston, Mass.

Mr. Weston spoke of the value of the original paper, which throws light on a problem whose solution has not been fully reached.

Certain wastes from what may be termed the carbohydrate industries, which wastes ferment with the production of acetic, lactic, butyric, propionic and other organic acids, cannot be treated successfully by methods employing biological oxidation alone, because the acids produced by killing the oxidizing bacteria check the oxidation before the destruction of the organic matter is complete.

A few examples will make this clear. The most familiar one is ordinary cheese. In the process of making this, there are present both the bacteria which "ripen" and produce the flavor and also those which would ultimately destroy the curd by putrefaction. Indeed, some notorious cheeses like Limburger, are in a state of arrested putrefaction. Usually the acid by-product stops the destructive process before the cheese curd is appreciably attacked, and by killing the excess of bacteria, makes the cheese a safe food.

In the manufacture of lactic acid from any saccharine liquid, like glucose and water, by the growth of lactic acid bacteria, like *B. bulgaricus,* it is impossible to produce, by fermentation, a concentration of more than 3 per cent of lactic acid, but by the addition of chalk or lime, the acid may be neutralized to form calcium lactate, when the fermentation continues. The calcium lactate is then recovered from the mash by concentration and crystalization, and the lactic acid recovered by decomposition of the lactate with sulphuric acid.

Because the fermentation process is not perfect, there results a trade waste containing both nitrogenous and carbonaceous organic matter—with calcium lactate, various organic acids, and unfermented saccharine bodies present. If this waste be discharged into lagoons along with calcium or other sulphates, the calcium lactate breaks down, with the formation of butyric acid, and the organic matter putrefies, with the formation of hydrogen sulphide, thereby producing a condition of indescribable nuisance.

Not much greater success attends the efforts to treat this waste on biological beds, for, unless the amount of organic matter be so small that oxidation may be completed without the production of an excess of acid, the process soon comes to a standstill, and a putrescible effluent results.

In the Tropics, and even in this country, there are many sugar factories so located that disposal of their wastes by dilution in streams is impossible. Frequently the only dilution medium is the distillate from the cane juice itself, and there are many localities in Cuba where the combined waste must be drained into a practically dry *arroyo*. The effects of such discharges offend every æsthetic sense, and there is evolved almost every stinking compound in the chemical dictionary, among which butyric acid and hydrogen sulphide predominate. The problem is more difficult in the Tropics than in the beet sugar region because of the lack of the beet wash-water. In fact, the warm, combined cane-sugar waste begins to ferment before it leaves the factory, and fifteen minutes afterward literally boils. At this stage, however, the fermentation is aërobic and inoffensive.

We made one attempt in Cuba to treat cane-sugar waste by an Imhoff tank and trickling filter, and with little success. In the first instance there was little or no sludge deposited, and the tank seethed like a cauldron until its contents became acid, after which no apparent effect, either of subsidence or of digestion, upon the waste passing through, could be noticed. The addition of lime to the inactive tank restarted violent action, but no single treatment with lime served to carry fermentation to a point where the tank effluent could be applied to a well-constructed trickling filter and produce a non-putrescible effluent.

In the second instance, the process was varied by aerating and lagooning the waste, between tank treatment and filtration, but this did not suffice. The best results were obtained by successive tank fermentations and lime treatment, followed by lagooning and filtration, but even then there remained the lime salts of the organic acids, prone to decompose into butyric acid and other offensive compounds.

How to transform carbohydrates into carbon dioxide gas and water is the problem. Professor Charles E. Coates of Louisiana State University has told the writer that one of his former students has attained success at one plant in Cuba by treating the factory waste with yeast in fermentation tanks preliminary to passing it through Imhoff tanks and trickling filters.

The experience of George W. Fuller of New York City* with the waste of a New Jersey factory producing butter substitutes and other edible fats throws a great deal of light upon the problem. The waste of this factory was handled successfully by a modification of the activated sludge process. Undismayed by the absence of sludge in the waste, Mr. Fuller built up that necessary factor in the process by adding cow manure and other similar substances. The process produced a well-clarified and non-putrescible effluent without resorting to subsequent filtration. The waste was rich in acid-producing constituents; yet Mr. Fuller states that "although it is a fact that the process is somewhat interfered with at times, it is much less sensitive to acids than one might suppose." The chief gain is the use of forced aëration and contact which evidently destroys not only the ordinary organic matter, but even the interfering organic acids themselves.

It seems to the writer that there are three means of purification to try out in these cases: Yeast treatment to remove sugar, activation to effect the destruction of the organic matter, and lime treatment as practiced by Mr. Greeley, to correct acidities which interfere with subsequent treatment. These means, singly or together, are the ones which seem most likely to succeed in solving problems of this perplexing class.

*Municipal and County Engineering—September, 1919.

Remember the date, August 30-September 3, 1920.

The Great A. P. H. A. West Coast meeting.

WHAT SHOULD BE THE BASIS OF THE CONTROL OF DEHYDRATED FOODS?

SAMUEL C. PRESCOTT,

Professor of Industrial Microbiology, Massachusetts Institute of Technology, Cambridge, Mass.

Read before Section on Food and Drugs, American Public Health Association, at New Orleans, La., October 28, 1919.

Since the War gave impetus to the preparation of dried or dehydrated fruits and vegetables, proper standards for inspection become necessary. Such standards are set forth by Professor Prescott. Dehydrated vegetables supply the same roughage values, the same fuel values and the same salts that fresh ones furnish, and their use is to be encouraged.

DEHYDRATED foods occupy, at the present time, a place of relatively small importance in the commerce of foodstuffs. The problems of those interested in this oldest of all processes of food conservation have hitherto been the problems of improvement of methods, by which it would be possible to secure a dried product which when properly cooked should be comparable in flavor, texture and food value to the same kind of food cooked from fresh materials. This problem has occupied mildly the attention of a few manufacturers during the past fifteen or twenty years, but rarely, until stimulation of the industry as a result of war conditions, has there been any very careful or scientific study of the processes involved, or much care as to the real quality of the product. Aside from the evaporation of fruits, dehydration as an industry hardly existed in this country previous to 1917, although there were isolated small factories producing a few tons of dried vegetables. The relation of this material to the whole general food supply was so insignificant that no special attempts at control had been made, and none were necessary. With the entry of the United States into the war it soon became evident that dehydration offered special advantages as a means of preparation for the fruit and vegetable components of the commissary supplies, and plants were installed hastily to meet this growing demand. At the beginning of the war no dehydrated products were considered by the Quartermaster Corps as desirable for the army ration, but within the year contracts for about 20,000,000 pounds were made. Dehydrated Irish potatoes, turnips, carrots and onions were purchased by the army, while of course "evaporated" and dried fruits have long been used in commissary supplies. The following year these figures were more than doubled or nearly trebled. With the cessation of the war, much of this production has ceased; but there remain a number of firms, who, while preparing much smaller tonnage, are giving marked attention to production of special lines of vegetables and fruits, to the fundamental problems of manufacture, and the cultivation of the markets, with the expectation that this method of food conservation will soon take an important position among the food industries, along with refrigeration, canning and preserving.

It at once became evident that there should be certain tentative qualifications required for these products, both as a means of protecting the government and

the consumer and as guides to the manufacturer, and it was my good fortune to prepare the first set of such requirements. These were later adopted, with slight modifications, as the standards for dehydrated products by the office of the Director of Purchase and Storage of the War Department. The standards accepted by the army applied primarily to vegetables. No standards for fruits have been officially set forth, as already certain understandings relative to evaporated fruits were fairly definitely maintained.

The basis for any control of such foods is twofold: the first is economic, to prevent fraud or deception; the second is hygienic, to guarantee sanitary quality and wholesome material, i. e., to ensure protection of health. Thus the marketing of dehydrated products made from stock of poor quality, or rendered inferior as a result of excessive age, wilting, fermentation or attacks by organisms of plant disease should be prevented. Similarly, products made from originally suitable material but which has become undesirable, unpalatable and nutritionally of low value through the use of insanitary or objectionable methods of handling, or as a result of infections with objectionable organisms, such as yeasts, molds, bacteria, insects, etc., should not be permitted to be sold.

The War Department also rejected materials which might have deteriorated from age. While it is possible that such deterioration may take place, we are still lacking definite data as to the effect of long storage on properly prepared and suitably packed materials.

It is evident that without good raw material a product of high quality cannot be secured as there is no process of conservation in which the finished material is of better grade than the materials employed in manufacture. It will also be evident that if materials of high quality are employed they may be seriously injured during the process of preparation unless special care is taken to maintain them as nearly as possible in their original quality. Furthermore, it is entirely possible to use high class materials, to prepare them by the most careful and intelligent methods and yet to have the product deteriorate through improper storage, insanitary methods of handling the finished goods, or exposure to excessive moisture, dust contamination or incursions of insect and microbic pests. Special studies are necessary in order to insure for each kind of material the highest quality of product. For example, methods of preparation of Irish potatoes may be quite unsuitable for leaf products or for certain other kinds of vegetables. Fruits may require a different procedure from the standpoint of pre-treatment and drying than the majority of vegetables. These are matters which the food manufacturer must study for himself before he can expect to place upon the market products which are sure to receive the approval of the consuming public. It is along this line also that the general inspection of dehydrated materials should, in my opinion, be conducted by food inspectors or by those charged with the problem of insuring to the consuming public, foods which are of the proper quality and free from objectionable material, which might conceivably be a menace to health. It seems to me, therefore, that the inspection of this new type of food material must begin with the factory and end with examination of the finished product as it is exposed for sale.

Specifications which have been prepared for the use of the army, constitute in a general way the foundation upon which the plans for control of dehydrated foods may be built. These may be expressed in relatively brief statements, as follows:

1. Raw material. All fruits and vegetables used for dehydration shall be of good quality, free from disease, sun-scald, frosting or other injury whereby they are rendered unsuitable in the fresh state for table use.

2. Preliminary treatment. All fruits and

vegetables so used shall be thoroughly washed and given such other treatment, as peeling, trimming, hot and cold dipping, as may be necessary to secure the best quality of product, and these processes shall be performed with the same care as that used in the preparation of vegetables for the table or for canning.

If pre-treatment by blanching or scalding is necessary to secure high quality products, this treatment shall be conducted promptly and in a clean and sanitary manner. All utensils used for this purpose should be of suitable construction to insure sanitary handling.

3. Process of drying. No detailed process of drying can be specified, but the process should be so arranged and handled that the products will not deteriorate while in the dryer, from spoilage or either as a result of action of yeast, molds or other microörganisms, or from physiological changes taking place in the material as a result of enzymes occurring naturally in the food itself. The process of drying should be so controlled that the food will not be seriously affected in color or have the flavor destroyed by scorching or for other reasons. The foods should lose only water during the process of dehydration and should not be so changed in physical structure that they will not return to approximately their natural form and appearance on being soaked in water. On proper soaking they should, within three hours at the ordinary temperature of the room, be restored to approximately their full size and natural appearance.

4. Protection against spoilage. After dehydration, fruits and vegetables which have been dried for human food should be packed at once in suitable, tight receptacles or stored in bins which have been specially prepared and which have adequate protection against vermin, insects, and molds and other microbic enemies. Such storage receptacles or containers should prevent access of moisture in sufficient amount to render the food material capable of fermentation or decomposition.

5. Insects. The greatest enemies of the dehydrated products are certain forms of weevils and other insects which may gain access to them, lay their eggs in the material and render them undesirable for food because of the development of worms and larvæ. All dehydrated products should be specially examined for such insects and their webs or cocoons, feces and eggs.

6. Sanitation of factory. The preparation of all dehydrated vegetables for army purposes should be conducted under cleanly and sanitary conditions and should be subject at all times to inspection by properly authorized officials. The methods of handling the finished product in the factory should be such as to preclude infection from boots, floors, and implements of any other external source. Care should be taken to impress upon the manufacturer that he is dealing with a food material and that it is essential for the welfare of the consuming public that such food materials should be placed before the consumer in a wholesome and uninfected condition.

EFFECT OF DEHYDRATION ON FOOD VALUE

The interest in commercial dehydration, as in domestic or community drying, has led to a number of interesting studies on the effect of dehydration in preserving the so-called vitamine substances which give to fresh vegetables their special nutritive or protective values and growth-promoting energy. The dietetic effect of green vegetables in preventing and alleviating scurvy and in supplying to the body certain other curative and growth-promoting substances has long been known. It has been suggested that dehydration tends to diminish the quantity of these substances by permitting certain chemical changes. The results of investigations to determine this point have not been entirely in accord and until generally accepted conclusions are reached, it seems undesirable to make any requirement pertaining to such effects a part of any system of inspection. While it is possibly true that dehydrated vegetables, like canned vegetables, contain less anti-scorbutic material than the original vegetables in fresh condition, this does not appear to constitute an argument against their use, as so far as can be determined they supply the same roughage value as fresh vegetables, the same salts and the same fuel values. From the practical standpoint, therefore, the use of dehydrated vegetables is certainly to be commended, providing they can be prepared from the best quality of raw material and by methods which conserve the food values to the highest possible degree. The great advantages of dehydration in making possible the utilization of materials which now goes to waste, in reducing the cost of carriage, in their easy transportability to all parts of the world, in the saving of expensive containers and in the stabilization of agriculture and the price of materials, seem incontrovertible and argue strongly for the development of this industry which we believe now to be only in its infancy.

SOCIOLOGICAL ASPECTS OF HOUSING

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Read before Sociological Section, American Public Health Association, at New Orleans, La., October 27, 1919.

Infant mortality is twice as great in homes without bathtubs, although the infants do not use them, and increases with lower rentals. Housing is also not to be separated from typhoid and respiratory disease. Health, education, standards, inspection, control of rent profiteering and a living wage are health factors related to housing.

ACCORDING to the lexicographer: "A house is a place of abode or shelter, a structure designed as a habitation; specifically, a building intended as a home or place of work for human beings."

From this definition it is evident that housing is not to be considered merely as a form of shelter against the ravages of the elements, but must be thought of in so far as it fulfills its purpose of serving as a home or place of work for thinking, active, living human beings. We are prone to overlook this phase of housing which is conducive to the development of normal family life.

During the war various schemes for housing were proposed, many of which were lacking in a recognition of the fact that many beings were to live within the confines of the hastily erected structures. At the conclusion of the armistice, most of these larger and more intelligent plans were discontinued, so the possibility of wholesale constructions were not realized. Since the armistice, the housing situation has been more acute; and as a result, careful attention to housing sanitation and hygiene has woefully declined.

While it is true that standards of house construction have been rising during the past decade or two, and that building laws have become more stringent, there are still no adequate standards by virtue of which rents may be gauged. The needs of protection against fire hazards, as well as the necessity for adequate air space and lighting, are matters well understood. In spite of the present information and the moderately developed degree of regulation, the housing situation is generally unsatisfactory from the standpoint of public health.

By many it would be claimed that housing conditions exist by reason of the working of the economic law of supply and demand, but this is insufficient to justify the existence of housing conditions inimicable to public welfare. As a matter of fact, housing conditions are largely determined by family income, and the problem is the same, whether under rural or urban conditions. If criticism is to be leveled against any particular form of housing, it must be most severe upon urban conditions where the coöperative interests increase the need for better living conditions. The isolation of houses in rural communities may threaten the health of the individual occupant, but in a sense it serves as a safeguard to those who are almost too remote to be regarded as neighbors. Even under these conditions, however, the matter of income determines whether the house and barn are to be practically under one roof, and as to whether outhouses and wells shall exist which are a source of danger.

In urban sections, whether one dis-

cusses detached houses or tenements, the character of the dwellings may be judged by the rent paid, and this in turn reflects the character of the income of the occupants. It is true that the relation of houses to parks and playgrounds, industrial centers, noisy or smoky areas; or their proximity to districts given over, willingly or unwillingly, to vice and crime, help to determine the rental value, These and numerous other factors, however, enter into the public health aspect of housing, and determine in part the healthfulness of the neighborhood.

It is unnecessary to cite an array of figures to demonstrate that homes vary with income. The amount of money to be given over to the provision of shelter is affected by the size of the family and the size of the income. In general, it may be said that the larger the family, the larger the percentage of income paid out for rent. It is equally true that the lower the amount of the income the higher percentage of it is spent for rent.

The matter of location, the type of house, whether old or new, the variation in the number of rooms, are not as significant in the determination of housing costs as the possibility of running water, running hot water, toilet facilities, and bath and heat. As an illustration of this, I am quoting the figures of D. W. Ogburn, *Monthly Labor Review,* September, 1919; taking as a basis five-room apartments. Those with bath and running water, but no heat, vary in cost from $13.00 to $32.29 per month; those with water but no bath or heat, from $9.02 to $15.12; those with no bath or heat, but with running water, $8.50.

The desire for a comfortable and sanitary home is normal to all save a negligible portion of the community, but the ability to secure healthful housing conditions is limited by the income. It may be said that housing is a commercial problem and that landlords cannot provide the types of dwellings desired without the ability of the tenant to give an adequate return upon the investment. There are ample data available from the experiences of philanthropic self-supporting building associations to indicate that a reasonable return upon investment is compatible with the erection and maintenance of sanitary, hygienic, modernized dwellings.

From the broadest viewpoint of public health, the state of the family income should not be permitted to jeopardize communal welfare. The financial weakness should not be penalized by a further impoverishment, that of health. The interests and health needs of the community should serve as a powerful force to bring about a finer type of housing than has thus far been developed for the masses. The relation of housing to health comprises various factors influencing the physical, mental and moral development of the family and family life. Whatever benefits each unit of family inures to the advantage of the public. Housing is not to be regarded as a simple matter of personal selection but its minimal standards should be an item of public concern. In its broadest sociological aspect, housing is a determiner of personal, family and communal health.

I admit at once that no agency can determine what rental is to be paid, for this is a matter of arrangement between landlord and tenant, principally landlord. I also grant that there are numerous laws, ordinances and regulations governing houses with a view to securing health and safety, but they are unfortunately more distinguished in the breach than in the observance.

It is patent that from the physical standpoint housing problems include air, light and heat, ventilation, bathing and toilet facilities, sewage disposal and protection from fire hazards; but the question of insects and rodents, modern plumbing, proper protection against the elements and the numerous subsidiary factors growing out of an intimate rela-

tion to them should not be deemed unimportant.

Mental health finds itself threatened by congestion, lack of privacy, impaired opportunity for home study, and the crowding of family life, with the numerous strains due to faulty physical surroundings. The moral health of a community merits greater attention than has been given, and is closely linked up with problems of room congestion, darkness, dampness, a lack of bathing and toilet facilities and the general unattractiveness so common in the homes and dwellings of those with limited income.

The influence of housing upon public health is manifested in the infant mortality question. As has been said, the house and home is largely determined by the income of the tenant and his ability to pay for hygienic surroundings. Some evidence as to the effect of housing upon infant mortality may be found from figures authorized by the Children's Bureau.

In Manchester, N. H., the mortality rate on the basis of rental was as follows:

175 babies.	Less than $7.50	211.4
703 babies.	$ 7.50 to $12.49	172.1
300 babies.	12.50 to 17.49	156.7
62 babies.	Over $17.50	100.0
168 babies.	Homes owned	86.0

The infant mortality decreases as rental increases. I recognize, of course, that there are other factors beside housing which enter into the mortality rate. In Johnstown, Pa., the infant mortality in homes with bathtubs was 72.6, and without bathtubs, 164.8. The number of rooms in the home relates itself to overcrowding. The greater the room congestion, the lower the standard of living; and, one may generally deduce a relatively lower wage. In Manchester, with less than one person per room, the infant mortality rate was 123.3. With one to two persons per room, the rate was 177.8, and with two to three per room it was 261.7. Lest it be urged that this is a condition which does not obtain in communities where higher wages are paid, it may be pointed out that in Brockton, Mass., where high wages exist, the infant mortality rate, where less than one person was found to the room, was 86.5, and where there was more than one person per room, 110.2.

Osler refers to tuberculosis as the house disease. Williamson, in the *British Journal of Tuberculosis,* 1915, commented upon the fact that 60 to 70 per cent of tuberculous persons came from houses of three rooms or less, and that the number of cases was larger in two-room houses than in three-room houses, and larger in one-room houses than in two-room houses.

House over-crowding is difficult to deal with, because, as Porter remarks in his *Elements of Hygiene and Public Health,* "It is the poor who overcrowd, and they only do so because they have not the means to pay for real and proper accommodations. Amongst the conditions associated with overcrowding are anemia, rickets, tuberculosis and probably other infectious diseases, since the resistance of persons exposed to overcrowding is apt to be reduced, either on account of it or of the attendant poverty."

The influence of crowds upon contagious diseases is fully appreciated, and administrative success in lessening the spread of contagion, requires an elevation of the standards of living, which includes better housing. In the words of Rosenau, "In addition to raising the standard of living, better houses diminish the chances of contact infection, afford better air and more sunshine, and tend generally to the well-being and uplift of mankind."

The problems of typhoid fever, malaria, plague, and venereal diseases are certainly not to be disassociated from housing questions.

The control of pneumonia and influenza and various other respiratory dis-

eases, involves problems of house sanitation in no small degree.

By some it is believed that there are places in which cancer is more likely to occur, although the evidence in this direction is unconvincing. Even the statement of Watkins-Pitchford that "Cancer houses usually appear to be unwholesome dwellings, often affording special facilities in their immediate neighborhood for the irradiation of their anemic inhabitants," is open to question.

From the standpoint of society, the improvement of housing calls for serious consideration; not merely as a part of the general plan for allaying economic unrest and the discontent now rampant, but also as a measure of promoting a higher degree of physical welfare in the community. It appears to be necessary to secure a more effective enforcement of health laws dealing with buildings to be utilized for living purposes. It would appear to be desirable to establish regulations to ensure the development of minimal standards of housing based upon the health needs, as determined by modern knowledge concerning the relation of housing to public health.

Raising the standards for home making is being attempted through various educational agencies and devices, but the obstacles to obtaining the desired results are numerous. Habits of cleanliness are difficult to instill with the absence of running water and home toilets. It is difficult to secure coöperation in matters of open windows if the possibilities of heating are insufficient, particularly when there are infants in the household. The possibility of home nursing is greatly lessened when room congestion exists and privacy is impossible. The seriousness of this is accentuated by the impossibility of providing hospital care for all who, for home reasons, require it. Administrative attacks upon rodents, bed-bugs, and pediculosis are greatly handicapped when the tenants cannot be held responsible for the conditions leading to their presence in large number, despite all efforts at cleanliness and control.

It is time that the mental and moral effects of housing problems received their full measure of study. The influence of these conditions is more usually manifest at the time of epidemics when the problem of communal psychology assumes unusual proportions. Physical health and freedom from preventable disease are in part determined by the maintenance of a high degree of what is so generally spoken of as "morale." Housing morale is not a negligible factor.

It is patent that housing is a primary need, and, as such, is of paramount importance. To improve housing conditions is to influence the standards of living favorably. Higher standards of living, in turn, advance public welfare and decrease physical and mental defects and diseases and raise the moral qualities essential for effective citizenship. Poor housing breeds disease and crime; disease and crime lower potentially earning capacity, with consequent inability to pay for hygienic surroundings; thus a vicious circle is established.

In order to secure the maximum benefits of housing, several steps are necessary: First, an appreciation of the sociological and health significance of hygienic dwellings; second, the education of the public as to the natural value and importance of sanitary dwellings; third, the rigid enforcement of laws, ordinances and regulations dealing with home construction and house alterations; fourth, the promulgation of minimum standards of housing construction, and particularly the regulation of standards of maintenance and repair; fifth, the establishment of some form of supervision or control that would prevent the exploitation of tenants through profiteering rentals and unwillingness to make necessary repairs required in the interest of family health and safety; sixth, the determination of rules and regulations for proper disinfection and fumigation following the presence of contagious

diseases, when such might prove a source of contagion to a new occupant; seventh, the encouragement of subsidized or non-subsidized programs of housing construction that would make available modern hygienic dwelling places at low rentals; eighth, the support by health departments of those measures tending to increase family incomes so as to bring about a minimum standard of living wage, consistent with the cost of living, in a manner that is conducive to health and comfort.

In dealing with housing, we have passed the stage of theorizing and have entered into a stage of practical performance. The house is no longer to be considered as a place of shelter, but as our definition states, "A building intended as a home or place of work for human beings." In our views upon the subject we have, therefore, aimed to stress the primary ideas which should dominate minds of public health workers.—"home" and "human beings."

TRAFFIC REGULATION AS A MEANS OF PREVENTING INJURY AND DEATH FROM STREET VEHICLES

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Mortality in New York City from auto accidents increased 735 per cent in 1917 over previous averages, and 940 per cent in 1918. Figures are duplicated elsewhere. Dr. Byrne urges radical measures of restriction and calls for a campaign for standard regulations with real penalties. He considers education of pedestrians and children very necessary.

When we endeavor to analyze the various causes of sickness and death in the registration area after eliminating those due to old age and prenatal conditions, we are confronted with a considerable number that should be, with proper education and care, preventable. Among these we would call attention to the rapidly increasing number of accidents and deaths due to the operating of street vehicles of all kinds, but, particularly, on account of their large and increasing percentage to those due to the self-propelled type.

With the introduction of every new method of human advancement intended to broaden the activities of everyday life and crowd days of energy into hours, and miles into feet, we meet with the same result—an unnecessary sacrifice of life and health due to neglect of care, or lack of knowledge, both of the new method and of the dangers to be met at each step forward. While recognizing that dangers must be met and risks must be taken in trying out each new method of shortening space and saving time, we have to admit that comparatively little attention has been given in the past to controlling the action of those who are careless, not only of their own lives and well-being, but who are also criminally neglectful of the health and safety of others.

When, however, we consider the immense advances already made and still

in progress in the mad rush, if I may say it, to bridge time and space by all classes of people and for all kinds of purposes; when we realize the increasing number of vehicles in proportion to population, together with the immense amount of money invested, not only in the vehicles themselves, but also in the building and improving of roads for their easier movement; we awake to the fact that the time has arrived to start a widespread movement to regulate and keep under control this increasing traffic for its own good as well as for the good and welfare of all.

For this purpose there should be well-defined regulations, as few and simple as possible, but with all the force that law can give them. We should not, however, lose sight of the fact that we are dealing with an industry which has proven itself of the highest value during the war, and which promises to be of the greatest importance in the transportation problems of the future. It will, therefore, be necessary to have laws so framed, which, while protecting the health and lives of the public as much as possible, will not place any unnecessary burden on commerce or block the way of progress.

That regulations of a rigid sort are, however, becoming more necessary than ever will be easily appreciated if we consider a few figures showing the increase of accidents and death due for the most part to avoidable errors or criminal neglect during the past few years. Taking the city of New York as an example, from the moderately settled to the most congested districts, we find that the mortality tables of the Department of Health show that the average number of deaths from automobile accidents during the five years of 1912 to 1917 was 377. In 1917 alone, it rose to 530 and in 1918 another increase brought it up to 677. This is the more striking when we compare the number of accidents and deaths from motor vehicles with those of other classes of street vehicles. In the city of New York there were reported to the police department 19,216 persons injured by street vehicles during the year 1918; 13,285 of these injuries were the result of the operation of motor vehicles. While the injuries by motor cars represent 69 per cent of all from street vehicles, the mortality from self-propelled vehicles represents 83 per cent of the total known dead from vehicular street traffic. In examining the records of other cities in the registration area we find this same condition prevailing, but in an even greater proportion. This might be readily assumed when we consider the very efficient traffic organization of New York City, and taking into account the fact that at traffic points in the most congested districts under care of traffic officers accidents are proportionately far less than at uncovered places, it will impress upon us the more forcibly the necessity of radical measures in dealing with those who make a menace of a great utility. As an illustration that moderate treatment is of little avail, I might quote the case of one offender who, in the course of nine months, was arrested four times for speeding and paid over two hundred and seventy-five dollars in fines without any apparent taming of his mania. He then received a sentence of ten days in jail. Whether this will result in a cure remains to be seen, but without criticism of the court, I believe a year's probation on a guarantee not to operate a motor vehicle would have a better result, at least as far as the public is concerned. The reports of accidents and mortality as a result of the operation of self-propelled vehicles received from many other cities, as well as the industrial and insurance experience tables issued by the Prudential and Traveler's Insurance companies fully bear out the same result as that of the city of New York. They all show the same constant and rapid increase in accidents and fatalities. In view of these facts, it would be well to start a campaign to have standard regulations for all

states to control the use of highways in the driving or operating of street or road vehicles. They should provide that vehicles should not be driven on public streets or highways without a license issued to the driver or operator after a strict examination as to his or her character, ability to drive or operate, and proper knowledge of the rules and regulations governing the driving or operating of a vehicle on a public street or highway. They should also provide for safe and reasonable speed regulations for different classes of vehicles. Proper regulations of the use of lights at night should be made, as this is an essential to safe night traffic; and while still open to discussion, could probably be met by requiring a shade on the left-hand light, so arranged as to throw the beam of light in alignment with that side of the vehicle. They should establish a limit to the width of a car or truck consistent with safety on narrow roads and streets.

Penalties should be fixed for the punishment of offenders so that licenses would be revoked or suspended according to the character of the offense. A questionnaire of standard type, with which every applicant for a license would be required to make himself thoroughly familiar, should be established for general use and information, so as to leave no room for argument as to what should or should not be done under any given circumstances. This could be readily edited by the proper officials with the aid and advice of the officers of the various automobile associations.

For cities and towns, regulations of a standard character should be made to meet conditions of city life, and in congested zones, an officer in charge at a convenient point. His directions should have the force of law and subject those who refuse obedience to arrest and imprisonment.

As children are largely sufferers from the result of street traffic, all educational establishments should be required to call the attention of their students repeatedly to the necessity of observing due care on public streets and highways. Educational campaigns should also, from time to time, be given to the public through motion picture houses and through the press, of the dangers to be expected from street vehicles and the proper way to avoid them.

The matter of control of the action of pedestrians in regard to street vehicular traffic is one well worthy of serious consideration; but it is of such character and presents difficulties requiring special study and thought too broad for the scope of this article.

Finally, should it not be a function of the American Public Health Association to take the matter up with the different state and municipal authorities, to bring about a result beneficial and satisfactory to all?

The 1920 Membership Campaign is on. Your individual quota is one member. Decide whom you will invite to membership and present his name.

DIPHTHERIA BACILLUS STAINS WITH A DESCRIPTION OF A "NEW" ONE

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Identification from younger cultures and consequently a quicker diagnosis of diphtheria, uniformly good results, ability to discern equally well by daylight and by artificial light, and easier recognition through the strengthening of the granules, are the claims made by Dr. Albert.

THE report of one or several "new" stains for diphtheria bacilli almost every year since 1895 would seem to indicate that none of those previously recommended have been entirely satisfactory.

To get an idea as to the number of stains that have been tried and recommended, one has but to consult a contribution by Graham-Smith,[1] which appeared in 1908 and another by Neisser and Gins,[2] which was published in 1913.

The alkaline methylene blue originally recommended by Loeffler[3] is still regarded by some bacteriologists as the most satisfactory stain for the diphtheria bacillus. It stains the granules and bars of the bacillus well, but since it also stains other bacteria rather intensely, it does not offer sufficient contrast to enable the bacteria to be readily observed.

Practically all of the efforts at finding a more satisfactory stain have aimed to secure more contrast between the granules of the diphtheria bacillus on the one hand and the remainder of this microorganism and other bacteria on the other. Greater contrast, due to difference in the intensity of the staining, may be brought about by the addition of acetic acid. Thus, according to the stain described by Mallory,[4] the granules take an intense blue stain, whereas the remainder of the bacillus and other bacteria are of a lighter blue color. An important objection to the use of this stain is the time required for the reagent to act—namely, 15 to 30 minutes.

Most of those who have experimented with the staining of this bacillus have aimed to secure a polychrome effect, i. e., to have the granules stain one color and the remainder of the bacillus and other bacteria, another color.

This may be accomplished to a certain extent by using a well-ripened solution of methylene blue which gives to the granules a reddish hue, especially when viewed by artificial light. The ripening of the solution may be brought about by exposure to sunlight for several months or by the addition of a rapidly acting oxidizing agent. The polychrome effect is due to a change of some of the methylene blue into azure. Other stains that give a polychrome effect are toluidin blue, and cresyl violet. Toluidin blue is the basis of the stains recommended by Pugh,[5] Ponder,[6] and Sutherland.[7] The use of cresyl violet was recently described by Greenthal.[8] These stains have been found to be very good. Combinations of various dyes have also been employed to produce a polychrome effect. Crouch[9] combined dahlia and methyl green, and Schauffer[10] mixed methylene blue and pyronin. The stain of this type which has proved most satisfactory in our hands is the one described by Kinyoun.[11] He used toluidin blue, azure and methylene blue.

Double and even triple staining has also been used with the idea of getting polychrome effects. Neisser[12] was the first to bring out a double stain of value. The method consisted of first staining the preparation with an acid solution of methylene blue and counter-staining with an aqueous solution of Bismarck brown.

The results obtained by the Neisser stain are so variable that many modifications of it have been made. In practically all of these Bismarck brown is retained as the counter-stain. Bronstein[13] used dahlia as the principal stain; Falières[14] used boraxed methylene blue; Ljubinsky[15] recommended pyoktannin, and Beck[16] the use of gentian violet. Debré and Letulle[17] have recently described a modification of the Neisser stain in which the first solution is heated. They renew the claim that their stain differentiates between the true and pseudo-diphtheria bacilli. We have found that this stain does not differentiate between virulent and non-virulent forms.

One of the principal objections to the Neisser stain, or its modifications, is that they do not stain the barred forms of diphtheria bacilli very well.

Of the stains which have heretofore been described, the following have been found most satisfactory:

a. Loeffler's methylene blue well ripened preferably by prolonged exposure to sunlight.

b. Toluidin blue or cresyl violet acidulated with acetic acid as described by Ponder and others.

c. Beck's modification of Neisser's stain.

d. Kinyoun's stain.

The staining effects produced by these several stains are represnted in Table 1.

The chief objections to Loeffler's methylene blue are: (1) other bacteria are stained too intensely and there is, therefore, not sufficient contrast; and (2) it is difficult to secure a proper polychrome effect with many preparations of the dye.

The toluidin blue stains are more satisfactory as "granule" but less so as "bar" stains. Barron[18] was able to improve its "bar" staining properties by the addition of potassium carbonate. The end result is, however, a too diffuse staining of the bacillus.

The Beck stain misses many of the barred forms of the diphtheria bacilli. Kinyoun's stain if allowed to act for five

TABLE No. 1—DIPHTHERIA BACILLI BY VARIOUS STAINS

Stain	Diphtheria Bacillus			Other bacteria	Remarks.
	Granules	Bars	Intermediate substance		
Loeffler's methylene blue	Reddish purple	Dark blue	Very light blue	Blue	Granules best seen by artificial light.*
Beck's modif. of Neisser's stain	Dark purple	.....	Brown	Brown	Bars do not stain as such.
Ponder's toluidin-blue	Reddish purple	Light blue	Very light blue	Light blue	Granules best seen by artificial light.*
Kinyoun's stain	Reddish purple	Bluish purple	Very light blue	Bluish purple	Granules best seen by artificial light.*
Author's stain	Black	Dark green to black	Light green	Light green	Granules stand out in marked contrast. Bars stain well—many appear like granules.

*Without the use of the blue glass.

minutes brings out the barred forms quite well. As a granule stain it is better than Loeffler's methylene blue. The Kinyoun stain has been our favorite for the past three years.

Of all the stains which have been described it may be said that they have either one or both of two defects from the standpoint of practical use in the diagnosis of diphtheria cultures. Some do not afford sufficient contrast to enable the diphtheria bacilli to be recognized with readiness. This applies to Loeffler's methylene blue, Ponder's, Kinyoun's and many other good stains. Others, although affording good contrast, fail to stain the non-granular forms of the diphtheria bacilli which results in missing some of them.

With the idea of overcoming, if possible, these defects, we tried out a large series of stains,and combinations of such, and compared these stains with those previously described. As a result of these experiments we have developed a stain which we believe to be superior to those in use at present.[19] Two solutions are used. Solution No. 1 has the following formula:

Toluidin blue	0.15 gram
Acetic acid (glacial)	1.00 cc.
Alcohol (95%)	2.00 cc.
Water (distilled)	100 cc.

Solution No. 2 is the same as the iodine solution used in the Gram stain. The formula is:

Iodine	1.00 gram
Potassium iodide	2.00 gram
Water (distilled)	300.00 cc.

Smears are made on slides or cover glasses in the usual manner; fixed by heat and stained with the toluidin blue solution for five minutes. The stain is then drained off without washing and the iodine solution applied for one minute. It is then briefly washed with water and dried, preferably by means of filter paper. It is now ready for examination.

Occasional lots of toluidin blue stain the diphtheria bacilli too uniformly. One that stains the granules well should be selected.

If staining is done in staining dishes, the iodine solution should be replaced with a fresh supply daily, since a precipitate results from the introduction of the toluidin blue stain carried over on the slide. The stained preparation should present a light greenish appearance to the naked eye.

By the use of this stain the granules of the diphtheria bacilli are stained black and stand out in marked contrast to other elements in the microscopic field. The bars of the bacilli take a dark green to black color, and the intermediate portions as well as other bacteria, a light green.

The granules of diphtheria bacilli stand out very much more prominently than they do by Loeffler's methylene blue and other stains commonly employed. The bars stain with varying intensity. Sometimes they stand out better; sometimes not as well as with the Loeffler stain. They are, however, easily recognized. In this respect it is very much better than certain stains such as the Neisser, which sometimes stain the granules very well.

The advantages claimed for this stain over others that have been described are:

1. Diphtheria bacilli are more readily recognized by virtue of the fact that the granules of the bacilli stand out in very sharp contrast to other portions of the bacillus and more especially to other bacteria which are but feebly stained.

2. Diphtheria bacilli may be recognized in younger cultures and hence the diagnosis made earlier.

3. The bacilli may be seen equally well by daylight and by artificial light.

4. The results of staining are uniformly good.

It is interesting to note that many structures which appear as bars by Loeffler's methylene blue, take a granular stain by the method described. It is also noteworthy that this stain shows up both a granular and a barred structure in

many diphtheria bacilli. The significance of these phenomena is now being studied.

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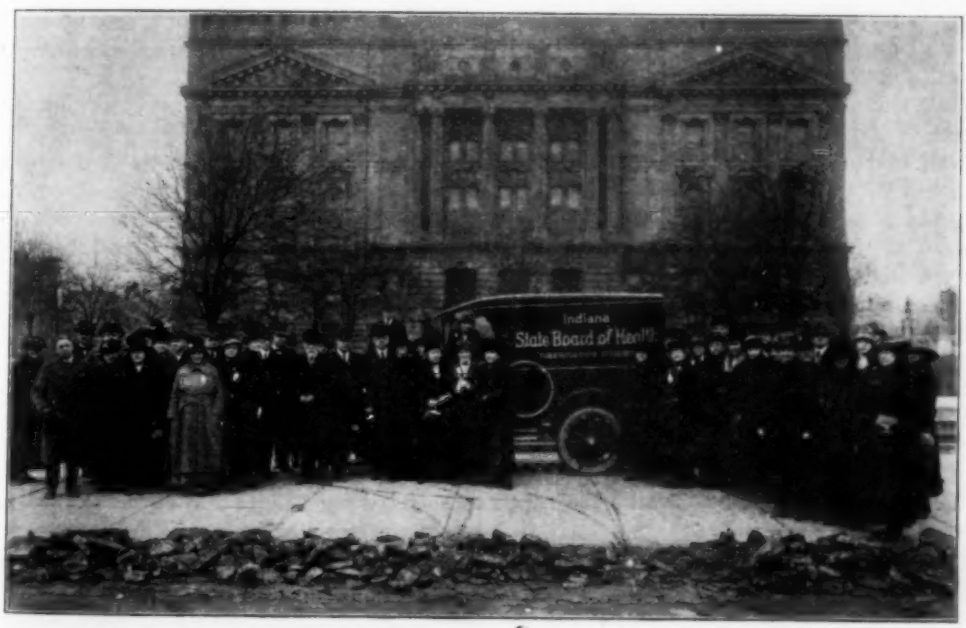
INDIANA'S WARFARE ON TUBERCULOSIS



Presented here is the outfit of the Tuberculosis Division of the Indiana State Board of Health, with members of the State Board, the personnel of the Division and members of the Indiana Tuberculosis Association grouped about it under the shadow of the State House in Indianapolis. It attests the seriousness of the campaign in this state.

INFANT MORTALITY IN THE REGISTRATION AREA FOR BIRTHS

WILLIAM H. DAVIS, M. D.,

Chief Statistician, Bureau of the Census, Washington, D. C.

Read before Section on Vital Statistics, American Public Health Association, at New Orleans, La., October 29, 1919

"A high infant mortality rate today is a greater disgrace than a high typhoid rate," writes Dr. Davis. It reflects on clergy, physicians, nurses, school teachers and editors alike, and gives a low rating for the intelligence of the people. Breast feeding is the first line of attack. Mothers should be taught how to care for their children.

ORGANIZED efforts to save infant life by teaching and helping mothers have been very successful in the last decade. Health reports of many cities and states show notable reductions in the infant mortality rates between 1910 and 1917. New York City, for example, had a rate of 126 per 1,000 births in 1910 and in 1917 a rate of 89. Philadelphia in 1914 had a rate of 121 and in 1917 a rate of 108. Boston in 1910 had a rate of 127 and in 1917 a rate of 99, and so on wherever the propaganda was spread and earnest efforts were made the infant mortality rates were lowered. In fact, there is every reason to believe that 1918 would have shown many record low infant mortality rates had it not been for the pandemic. In Indiana, for example, the rate for 1918 was 87 against 86 for 1917. But if the excess deaths from influenza and pneumonia in the last four months of 1918 could have been prevented the rate would have been only 81. Similarly in Kansas the rate of 81 for 1918 would have been reduced to 77, and in Philadelphia the rate of 124 would have been reduced to 114. But we can not point to these rates with complete satisfaction, for the rates for Norway, Sweden, and Australia, for example, are still so much lower than the rates in this country that we must conclude that there is much work yet to be done to eliminate that part of our infant mortality rate which is preventable. We do not need to go to foreign countries, however, to find such low rates for the annual reports of the Bureau of the Census show that a few cities in the birth registration area have had rates below 50.

In 1917 the lowest infant mortality rate for any state in the birth registration area was 67 for Minnesota, with Utah and Washington close behind, each 69. In 1918 Utah had the lowest rate (64) well below the 1917 rate of 69, but no other state shows a lower rate for 1918 than for 1917.

The trend of infant mortality, even since the establishment of the birth registration area in 1915, has been most encouraging and I think we have every reason to believe that the downward trend will still continue, for it is coming to be recognized more and more that the big factor in reducing infant mortality is breast feeding. There are other factors to be sure; prenatal care, heredity, the family pocket book, motherly care and proper obstetrical care, all are important. but the *great factor is breast feeding.*

Let us analyze briefly a few rates which show marked declines between 1915 and 1917.

In 1915 New York City had a rate of 99 and in 1917 a rate of 89, a decline of 10 per 1,000 births and yet no part of this decline can be credited to any saving of lives under 1 month of age. In the eight months interval between the ages of 1 month and 9 months there was a decline of 8.4 per 1,000 to be credited about equally to each month of the interval, while the decline between 9 months and 12 months was less marked, amounting to only 1.7 per 1,000 births

INFANT MORTALITY RATES
IN THE BIRTH REGISTRATION AREA
1915 TO 1917
AND PROVISIONAL RATES FOR 1918

Area Cities of 100,000 Population in 1910	Deaths under 1 year of age per 1,000 births			
	1915	1916	1917	1918
Bridgeport, Conn	97	106	87	100
New Haven, Conn	87	88	84	90
Washington, D. C	111	106	97	112
Indianapolis, Ind	....	....	95	93
Louisville, Ky	....	....	97	114
Baltimore, Md	....	....	118	150
Boston, Mass	103	105	99	115
Cambridge, Mass	93	91	75	107
Fall River, Mass	167	173	159	180
Lowell, Mass	156	146	140	160
Worcester, Mass	93	101	95	97
Detroit, Mich	105	112	103	100
Grand Rapids, Mich	71	75	83	86
Minneapolis, Minn	71	82	71	73
St. Paul, Minn	78	68	74	87
New York	99	93	89	92
Bronx Borough	81	72	80	77
Brooklyn Borough	93	88	85	91
Manhattan Borough	106	102	94	97
Queens Borough	103	95	93	93
Richmond Borough	109	93	91	106
Rochester, N. Y	84	86	84	93
Syracuse, N. Y	98	100	102	119
Cincinnati, Ohio	....	....	88	104
Cleveland, Ohio	....	....	109	98
Columbus, Ohio	....	....	88	101
Dayton, Ohio	....	....	96	87
Toledo, Ohio	....	....	95	94
Philadelphia, Pa	104	105	108	124
Pittsburgh, Pa	110	115	120	139
Scranton, Pa	119	131	148	141
Providence, R. I	106	110	102	....
Richmond, Va	....	....	136	147
Seattle, Wash	....	....	61	62
Spokane, Wash	....	....	62	78
Milwaukee, Wis	....	....	100	106

for the three months. Examining now the causes of death which figured in this decline, congenital debility is found to have declined from 13.7 per 1,000 births to 9.2, and diarrhea and enteritis from 23.7 to 20.8.

In 1915 Connecticut had a rate of 107 and in 1917 a rate of 94, a decline of 13 per 1,000 births; 1.9 for the first month of life; 2.1 for the second month of life; 3.1 for the third month of life, the decline for the first three months of life thus accounting for over 50 per cent of the total decline. The decline of 13 per 1,000 births was almost entirely due to a decline of 8.4 per 1,000 births for diarrhea and enteritis and a decline of 3.8 for congenital debility.

So in an examination of almost any series of infant mortality rates the one great fact which stands out is that the infant mortality rate follows the rate from diarrhea and enteritis. If a city has a high infant mortality rate you may be sure that it has a high infant mortality rate from diarrhea and enteritis, and if it has a low infant mortality rate you may be sure that it has a low infant mortality rate from diarrhea and enteritis. For example, Fall River in 1917 with a rate of 159 shows a rate of 64 from diarrhea and enteritis, while Seattle with a rate of 61, shows a rate of 4 from diarrhea and enteritis. Again, if a great decline has occurred in an infant mortality rate, you will find that there has been a great decline in the rate from diarrhea and enteritis. And the point I wish particularly to emphasize is that until this factor is practically eliminated from the infant mortality rate, our energies should be directed towards its elimination because that field of endeavor still offers the best promise for great success.

New Zealand in 1907 had a rate of 89, of which one-fourth was from diarrhea and enteritis. In 1916 the rate from this cause was less than six and the infant mortality rate had been reduced to 51.

Some idea of the directions in which a reduction of the infant mortality rate is to be expected and to be sought can be obtained by a study of the tables which accompany this paper.

What has been done can be done again.

If Seattle was able to show a rate of 4.9 for age period 3 to 6 months, then it should not be considered impossible for other places to reduce their rates for that age period to the same low mark. If Seattle was able to show a rate of 4.3 for diarrhea and enteritis, then it should

[Rates in bold face type are based upon less than 5 deaths. Numbers after the causes of death correspond to those of the abridged International List.]

Age and cause of death	Infant mortality rates																		
	The birth registration area	Connecticut		Maryland			Minnesota		Virginia			Fall River, Mass.	New York, N. Y.		Seattle, Wash.	Washington, D. C.		Commonwealth of Australia
				Total	White	Col.			Total	White	Col.							
	1917	1915	1917	1917	1917	1917	1915	1917	1917	1917	1917	1917	1915	1917	1917	1915	1917	1915
Age																		
Under 1 year	93.8	107.1	93.7	119.8	100.9	201.0	70.2	67.4	97.8	80.4	136.5	158.9	98.8	89.0	60.5	111.1	97.4	67.5
Under 1 day	15.0	14.0	13.9	18.4	17.4	22.5	16.5	16.3	14.9	14.7	15.3	15.2	12.0	12.3	13.9	18.8	16.3	
1 day	4.6	6.2	5.4	4.6	4.3	5.9	3.6	3.5	4.2	3.6	5.7	4.2	3.7	3.7	5.3	7.7	7.7	23.9
2 days	3.5	3.6	2.8	4.0	3.3	6.8	3.6	3.0	3.3	2.8	4.6	3.9	2.8	2.9	3.5	4.6	4.5	
3 to 6 days	6.7	6.0	6.2	6.2	5.3	10.1	5.7	5.9	7.3	6.2	9.8	4.7	5.5	5.7	7.8	6.0	6.4	
1 week	6.0	6.3	6.0	6.5	5.4	11.0	5.4	5.8	6.9	5.8	9.4	5.8	5.2	4.8	3.7	5.6	4.9	3.9
2 weeks	4.2	5.0	5.0	4.3	4.0	5.6	3.6	3.0	3.9	3.8	4.0	6.6	3.7	3.8	3.5	5.8	2.9	2.4
3 weeks, but less than 1 month	3.4	3.6	3.5	3.3	2.5	6.7	2.8	2.5	3.1	2.8	4.0	6.0	3.2	3.1	1.2	2.6	1.6	2.1
1 month	8.4	10.7	8.6	10.9	8.7	20.2	6.2	5.4	8.8	7.4	12.1	12.9	8.9	7.8	4.9	8.8	9.1	5.6
2 months	6.6	9.2	6.1	9.0	6.5	19.6	4.5	4.0	7.2	5.5	11.1	15.2	7.6	6.0	3.3	7.4	6.8	4.1
3 to 5 months	15.1	18.5	15.9	22.8	18.1	42.8	8.3	8.2	16.5	12.5	25.6	31.3	18.3	15.0	4.9	18.2	15.0	10.1
6 to 8 months	11.1	13.0	11.4	17.1	14.4	29.0	5.6	5.3	11.9	8.2	20.0	26.0	15.2	12.8	5.1	14.1	11.2	8.5
9 to 11 months	9.2	10.9	9.1	12.8	10.9	20.8	4.3	4.6	9.6	7.2	15.0	27.1	12.8	11.1	3.3	11.7	10.8	6.9
Cause of death																		
All causes[1]	93.8	107.1	93.7	119.8	100.9	201.0	70.2	67.4	97.8	80.4	136.5	158.9	98.8	89.0	60.5	111.1	97.4	67.5
Measles—5	1.2	0.5	1.1	0.7	0.7	0.9	0.4	0.7	1.4	1.3	1.6	6.0	1.1	1.1	1.0	**0.3**	**0.4**	[3]
Scarlet fever—6	0.1	[2]	**0.1**	[2]	[2]		**0.2**	**0.1**					0.1	[2]				[3]
Whooping cough—7	2.4	2.6	1.6	2.3	1.7	4.7	2.0	1.1	4.1	2.6	7.4	3.7	1.5	1.7	1.6	1.4	0.7	0.9
Diphtheria and croup—8	0.5	0.4	0.3	0.5	0.5	**0.5**	0.4	0.2	0.6	0.6	0.7	**1.1**	1.0	0.9		**0.3**	**0.4**	[3]
Influenza—9	0.8	1.0	0.9	0.4	0.3	1.1	0.5	0.6	0.7	0.5	1.0	**0.5**	0.3	0.4	**0.2**	**0.4**	**0.3**	[3]
Dysentery—(12)	0.3	0.6	0.3	0.2	0.2	**0.3**	0.1	0.2	1.0	0.7	1.5	**0.5**	0.1	0.1		**0.1**	**0.1**	[3]
Erysipelas—(12)	0.5	0.7	0.6	0.2	0.3	**0.2**	0.3	0.3	0.3	0.4	**0.1**	**0.3**	1.1	0.8	**0.6**		**0.1**	[3]
Tetanus—(37)	0.1	0.2	0.2	0.3	0.2	0.8	**0.1**	0.1	0.5	0.3	1.0		0.1	0.1				[3]
Tuberculosis of the lungs—13	0.6	0.4	0.7	0.7	0.3	2.3	0.3	0.3	0.8	0.4	1.6	**1.1**	0.6	0.6		0.7	**0.1**	0.1
Tuberculosis meningitis—14	0.7	0.9	1.3	0.4	**0.4**	**0.2**	0.5	0.5	0.6	0.5	0.6	**0.5**	1.3	1.0	**0.8**	1.1	**0.4**	0.3
Other forms of tuberculosis—15	0.2	0.5	0.2	0.2	0.3	**0.3**	**0.1**	**0.1**	0.1	**0.1**	**0.2**		0.2	0.1			**0.1**	0.1
Syphilis—(37)	1.2	0.7	0.7	2.2	1.3	6.1	0.7	0.7	1.5	0.8	3.2	0.5	1.6	1.5	1.8	4.0	4.0	0.5
Meningitis—17	0.8	1.5	1.5	0.7	0.8	**0.5**	0.7	0.8	0.8	0.9	**0.6**	**0.3**	0.5	0.7		1.3	0.7	1.8
Convulsions—(37)	1.1	1.1	1.1	1.6	1.2	3.3	1.5	1.1	2.2	1.0	4.7	1.6	0.4	0.3	**0.6**	1.3	0.8	2.1
Organic diseases of the heart—19	0.3	0.2	0.1	0.5	0.5	**0.3**	0.1	0.1	0.3	0.3	0.5	**1.1**	0.2	0.1		**0.4**	**0.4**	[3]
Acute bronchitis—20	2.2	2.7	2.2	3.5	2.6	7.3	1.2	0.9	1.1	0.7	2.1	4.5	3.1	3.6	**0.6**	3.4	1.6	1.5
Pneumonia—22	4.2	4.6	4.6	5.2	3.7	11.6	2.4	2.2	4.7	2.9	8.9	6.6	4.0	4.7	1.8	4.1	1.9	2.0
Bronchopneumonia—(23)	8.3	9.1	8.3	12.1	8.8	26.5	7.5	6.5	5.6	4.1	9.0	17.3	13.9	9.8	2.9	9.5	8.1	2.6
Disease of the stomach—24	1.2	1.6	0.9	1.1	0.8	2.2	0.8	0.7	1.2	1.0	1.6	**1.1**	0.3	0.3	1.2	1.0	0.9	[3]
Diarrhea and enteritis—25	20.0	30.8	22.4	32.8	28.8	49.8	8.9	8.8	17.1	13.9	24.2	63.8	23.7	20.8	4.3	21.2	24.4	16.3
Malformations—(33)	6.3	5.5	5.8	6.8	6.5	7.9	5.6	6.2	4.0	4.6	2.4	7.4	4.7	4.7	7.4	4.6	4.3	3.7
Premature birth—(33)	19.1	17.5	17.4	21.8	20.6	27.0	18.2	19.1	17.6	17.7	17.2	16.8	15.8	16.6	17.2	28.7	27.5	
Congential debility—(33, 37)	8.8	12.5	8.7	12.8	11.0	20.6	8.2	7.0	11.9	8.7	18.9	5.5	13.7	9.2	7.4	15.8	9.9	29.4
Injuries at birth—(37)	3.8	5.1	5.6	3.6	3.5	3.9	3.0	3.0	2.0	2.1	1.6	5.5	3.6	4.3	6.2	4.1	4.4	
Violent deaths (suicide excepted)—35	1.3	0.9	1.1	1.0	0.8	1.9	0.7	1.1	2.0	1.6	3.1	2.6	0.9	1.3	1.0	1.4	0.7	[3]
Unknown or ill-defined diseases—38	2.9	0.8	0.6	3.7	1.4	13.3	1.7	1.2	11.1	8.5	16.8	5.5	[3]	[3]	**0.4**		**0.1**	[3]
All other causes	4.8	4.7	5.3	4.4	3.6	7.6	3.9	3.8	4.7	4.2	5.9	5.3	4.8	4.1	3.3	5.8	4.9	5.7

[1]Exclusive of stillbirths. [2]Less than one-tenth of 1 per 1,000 births. [3]Included in "All other causes."

INFANT MORTALITY RATES
IN THE BIRTH REGISTRATION AREA
1915 TO 1917
AND PROVISIONAL RATES FOR 1918

Area	Deaths under 1 year of age per 1,000 births			
	1915	1916	1917	1918
Connecticut	107	101	94	107
Rural	119	101	96	111
Cities	103	101	93	106
Indiana	....	....	86	87
Rural	....	....	78	77
Cities	....	....	100	102
Kansas	....	....	77	81
Rural	....	....	73	75
Cities	....	....	98	107
Kentucky	....	....	87	95
Rural	....	....	85	91
Cities	....	....	103	120
Maine	105	108	93	104
Rural	104	102	89	102
Cities	109	128	107	111
Maryland	....	121	120	141
Rural	....	122	123	135
Cities	....	120	116	147
Massachusetts	101	100	98	113
Rural	92	87	91	106
Cities	103	103	99	115
Michigan	86	96	88	89
Rural	78	87	80	81
Cities	96	106	97	97
Minnesota	70	70	67	71
Rural	67	66	64	68
Cities	77	78	75	79
New Hampshire	110	115	110	114
Rural	89	97	86	102
Cities	131	133	132	124
New York	99	94	91	97
Rural	89	83	85	94
Cities	102	97	93	98
North Carolina	....	....	100	104
Rural	....	....	96	99
Cities	....	....	159	170
Ohio	....	....	92	94
Rural	....	....	79	87
Cities	....	....	103	100
Pennsylvania	110	114	111	128
Rural	110	114	109	127
Cities	110	114	113	129
Rhode Island	120	111	108	....
Rural	129	93	101	....
Cities	118	116	109	....
Utah	....	....	69	64
Rural	....	....	71	63
Cities	....	....	66	66
Vermont	85	93	85	93
Rural	80	86	81	88
Cities	116	128	108	120
Virginia	....	....	98	104
Rural	....	....	91	94
Cities	....	....	129	146
Washington	....	....	69	69
Rural	....	....	75	71
Cities	....	....	62	68
Wisconsin	....	....	78	80
Rural	....	....	69	69
Cities	....	....	92	100

not be considered impossible for other places to show a like rate. Extreme poverty may be an important factor in some cases, but in this country the problem is largely one of education—every mother and every prospective mother must be taught how to care for her child, and the city which is most successful in inducing mothers to breast-feed their children will be the city to show the lowest infant mortality rates. Moreover, this campaign of educating mothers must be carried on not only this year and next, but every year so long as there are babies to be protected.

A high infant mortality rate today is a greater disgrace than a high typhoid rate, for a high typhoid rate may be due to one milkman's carelessness, or to the laxness of a few city officials in not properly safeguarding the water supply or the milk supply, but a high infant mortality rate reflects upon the clergy, reflects upon the physicians and nurses, reflects upon the school teachers and editors, all of whom have a joint responsibility not only to instruct mothers, but also to induce them to care for their babies properly. Furthermore, a high infant mortality rate today reflects upon the intelligence of the people.

Now that the war is over and the epidemic is past, no better or nobler work can be found for health officers and others than to stir up general interest in campaigns to reduce infant mortality.

Let every locality strive for a record infant mortality rate.

□

Anent the 1920 Membership Campaign! You, Mr. Member, have in mind some to propose for Membership in the A. P. H. A. You have (see page 370) the name of your State Campaign Chairman. You have only to bring the two together.

THE PURIFICATION OF OYSTERS AS A CONSERVATION MEASURE

WILLIAM FIRTH WELLS, M. D.,

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Read at hearing of Oyster Growers before the Commissioner of Health of New York City, March 1, 1920.

Give the oyster a chance to cleanse itself and typhoid will be as preventable here as with domestic water supplies. This is the motif of this paper by Dr. Wells, who is no new hand at discussing shellfish problems. "It can be considered a conservation measure," he urges.

A RECENT statement of the Metropolitan Life Insurance Company shows a reduction in general mortality at ages 1-74 in eight years of 17.9 percent. This actual saving to policyholders should convince all of the commercial value of modern methods of sanitation. Chief among infectious diseases is the reduction in typhoid fever of 69 percent due to improved water and food supplies. Thus the end has justified the means, and unquestionably sanitation has come to stay.

The first board sanitary movement was the improvement in water supplies. It was found necessary with the growth of population to take measures to prevent the pollution of natural waters as far as possible, and to seek carefully for the purest sources available for water supplies. The next movement came in the production of clean milk. Former slovenly methods of dairy practice were condemned, and a new standard was raised for dairy farms. This, at first, came as a distinct hardship to the industry, but gradually adjustments have been made until the production of milk under improved conditions is just as natural as was the production twenty-five years ago under conditions which we could not tolerate today. Likewise the oyster industry shared the general attack of sanitarians, and consequently, former practices of taking up clean oysters and placing them in rivers receiving the sewage of large cities in order to float or plump them, have been universally condemned and abandoned. Contaminated grounds which formerly were tolerated as maturing grounds for oysters have been condemned, and as a result it may be generally stated that oysters today can be eaten with impunity, and with full satisfaction that they are produced from reasonably clean areas. The activities of the Boards of Health thus give assurance to the public that whatever products they receive with the endorsement of the health authorities are safe.

Sanitation, however, has not stopped here. However much improvement in our water supplies has been secured by the treatment of sewage discharged into natural waters, or by changing to supplies less polluted by sewage, it is now generally recognized that such methods are not complete. Science has produced methods for the treatment of water supplies by which all vestiges of suspicion may be removed. Like-

wise with the milk supply; however clean may be the conditions under which it is produced such milk is not considered absolutely safe. Possibilities always exist for the accidental infection of milk in the process of handling, and here science has produced a simple and effective way of pasteurizing milk so as to remove the last faint possibility of suspicion.

The same problem exists in the oyster industry today. Whereas oysters generally may be considered free from contamination, there are practically no conditions under which oysters are naturally produced where contamination is not possible. The waters over the beds are open to navigation, and not absolutely free of access to accidental or occasional pollution. While under ordinary circumstances these possibilities may be considered negligible, it is true that they are possible, and while such a condition exists the Board of Health must always give its endorsement with reservations, and in the minds of the consuming public will linger a faint lack of confidence which they enjoy in full in their water and milk supplies. Until measures similar to those used in the purification of water and the pasteurization of milk are utilized in the oyster industry, the public is bound to lack the satisfaction in oysters which it should rightfully have.

Looked at from the standpoint of the Board of Health, what standard should be demanded of the oyster? A general statement has been made that oysters should be grown in waters as pure as those which would be tolerated for drinking. But if we apply this standard, which seems reasonable, we could make a general statement concerning oysters that practically none are grown in waters which would be endorsed without treatment from a sanitary point of view for drinking. Health boards make the general rule that all surface waters are open to pollution, and therefore, all such supplies should be treated. Oysters are grown in surface waters, and to be consistent with rigid water supply standards all oysters should be purified.

The United States Public Health Service in its investigation of coastal waters, with special reference to the shellfish industries, soon discovered this fact, but from a practical point of view it did not seem reasonable to enforce such a standard, which would make oyster production practically impossible, until some simple and efficient method of purification was available. The Service carried out experiments to discover how rapidly oysters purified themselves if transferred to clean water. The remarkable ease with which oysters became polluted or cleansed, according to the conditions of their environment, convinced the authorities that transfer to clean surroundings would be an economic means of removing any possible pollution. Carrying these experiments further, I proposed a method whereby the oysters would be allowed to purify themselves by natural function in artificially purified water. These experiments have been thoroughly tested, both scientifically and practically, and been found to be a feasible means of guaranteeing the character of the oyster. Dr. Cumming, under whom these experiments have been demonstrated, and who since has been nominated Surgeon-General by the President, unqualifiedly endorsed the method and recommended its use in Raritan Bay.* There is no question, therefore, but that the oystermen and the health authorities have a common meeting ground on which the one can produce

*U. S. Public Health Service, Public Health Bulletin No. 88, page 41.

oysters, and the other can guarantee them.

I have successively proposed this method as a scientific, sanitary measure (Under U. S. Public Health Service), and as an economic measure of production (Under the U. S. Bureau of Fisheries), and it is true that the purification of oysters can be considered as a conservation measure, and the reason for my discussion is interest in this phase of conservation. The present food shortage and high cost of living requires that every available source of food be developed which can be legitimately utilized. It is not merely a question of oyster culture, but a question of food production. The same problem arises in many of our other food producing industries. Careless use or abuse of the waters has been causing them to be less and less valuable for the natural production of fish. The increased contamination is bringing about a condition in the shellfish industries similar to that which has made the purification of waters used for drinking purposes necessary. This creates a legitimate field for the method of purifying oysters, whereby it will be possible to give a guarantee to the oyster and retain in production many valuable beds.

Briefly stated this method of purification consists of nothing more than assuring conditions of cleanliness under which the oyster can, by its natural function, remove any pollution received from the water. Ordinarily the oyster is very active in filtering out and digesting fine particles which are drifting in the water. If kept in clean surroundings, the oyster is just as active in returning these substances into the water. Under ordinary conditions an oyster passes fifty gallons of water a day through his gills, and a particle of food deposited on those gills will pass on to the mouth and be eliminated from the oyster within five hours. If conditions are maintained such that pollutions are removed, and new ones are not permitted to enter the oyster, it is possible to cleanse a polluted oyster within a remarkably short period. Twenty-four hours has been found sufficient under ordinary conditions of practice. With slightly polluted oysters less time is required than for grossly polluted oysters. The latter, which it would not be proposed to treat, might require a longer period than twenty-four hours.

The only reason why this process has not been more rapidly developed commercially has been the difficulty of bringing about an agreement between the different parties interested. If anything can be done to bring about the development of a large, well-operated, carefully supervised plant, the condition of oysters so desirable to establishing the confidence of the people in oysters can readily be guaranteed. No one proposition today promises more to put the oyster back on the bill of fare in the proud position which it formerly enjoyed.

□

7,500 A. P. H. A. Members will easily be reached, if every present Member will only help.

STUDIES ON THE VIABILITY OF THE TUBERCLE BACILLUS

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These observations suggest that open cases of tuberculosis should not be admitted to wards of a general hospital and emphasize the need of housing advanced cases under good control. Dust rising from dry-swept floors, even where phenol was used, produced the disease in guinea pigs.

THE establishment by Koch, of the etiologic relation of the tubercle bacillus to all forms of tuberculosis, led to much scientific investigation in regard to its habitat outside of the human body, its viability and the method of transmission from one individual to another.

The earlier investigators were inclined to place the tubercle bacillus among the more resistant spore-forming micro-organisms, and searches were made in divers places entirely away from the human body in attempting to prove its ubiquity.

The question was eventually settled by Cornet and co-workers, that the tubercle bacillus is found in appreciable numbers only in close proximity to the individuals who suffer from the disease, and is present in smaller numbers in places less frequently visited by the diseased individuals. He was the first to recognize the deleterious influence of such factors as light, dessication, temperature, and the length of time outside of the human body on the organism. These either lower the vitality and render it innocuous or destroy its power to grow at all, either in favorable media or susceptible animals.

A thorough review of the literature of numerous investigators, as to the length of time the bacillus can remain alive and virulent outside of the human body was made by M. J. Rosenau (1), of the Harvard Medical School, and presented at the Sixth International Congress of Tuberculosis, and in summarizing the work, together with his own investigations, he concludes that the organism deprived of its environment is no more resistant than other non-spore forming bacteria.

E. R. Baldwin (2) states that the length of time that the tubercle bacillus can remain alive and virulent in human sputum depends on the size and thickness of the mass, its place of deposit, its quality, and most important its exposure to light and air. When the sputum is of tenacious character, and forms hard, glue-like masses, and is kept in a cool, dark place, such as a basement, the maximum period of vitality is from six to eight months.

Park and Williams (3) state that under ordinary conditions sputum will usually retain its infectious power for two or three months, and exceptionally as long as one year.

Twitchell (2) found that sputum placed on a handkerchief will remain infectious as long as seventy days and on a carpet, lesions resulted in guinea pigs after thirty days, but not after seventy days. Direct sunlight caused the death of the organism after several hours.

When pure cultures of the bacillus are subjected to detrimental agencies,

an entirely different result is obtained. Thus it has been shown by John Weinzirl, (4) Department of Bacteriology, University of Washington, that diffuse light will kill the tubercle bacillus usually in about three or four days.

Theobald Smith (5), formerly of Harvard Medical School, has shown that cultures on nutritive media will remain alive from seven to nineteen months.

Our investigations in regard to the viability of the tubercle bacillus were undertaken for the purpose of determining whether or not the organism can be dried to dust form under natural conditions and still remain living and virulent.

Experiment I. Dust was collected from the floors of the open wards, and about two drachms first treated with 45 cc. of sterile 2% NaOH solution, incubated at 37°.5 C for 20 minutes and centrifugalized in a high power electric centrifuge for 10 minutes. At the end of this time, the coarser particles had settled to the bottom, leaving a thick, yellow emulsion above. This was removed with a pipette and washed twice with sterile .89% sodium chloride solution. The remaining sediment was emulsified and injected into the right lower quadrant of a guinea pig and each pig placed into a separate cage. Eleven pigs were injected November 25, 1918. They were etherized and examined at different times. Out of eleven pigs, seven were negative and four showed tuberculosis. (See tables.)

Experiment II. Dry dust and small particles of dirt were collected from the morgue floor and prepared for injection as in Experiment I. Four pigs were injected November 22, 1918. On February 26, 1919, all pigs were etherized and examined. Three presented generalized tuberculosis, and one tuberculosis of the inguinal gland on the injected side.

Experiment III. Dust was collected from the windows and shelving of the morgue and from the tops of specimen jars, and prepared as in the two previously described experiments. Five pigs were injected November 22, 1918. They were etherized and examined at different times. Two pigs presented generalized tuberculosis and three were negative.

Experiment IV. Ten pigs were placed in a sterilized wire cage and kept about three feet above the morgue floor, which was dry swept every morning. The animals remained in the morgue on an average of five hours daily for a period of eighteen days. After each exposure, they were removed, given a bichloride bath, and

RESULTS OF EXPERIMENTS

EXPERIMENT I

Date of Autopsy	Pig.	Results
1-15-19	1	Negative.
1-15-19	2	Negative.
1-15-19	3	Negative.
2-17-19	4	Tuberculosis of the inguinal and cervical glands, spleen and lungs.
2-17-19	5	Tuberculosis of the spleen, lungs and bronchial glands.
2-21-19	6	Negative.
2-24-19	7	Generalized tuberculosis.
2-24-19	8	Generalized tuberculosis.
2-25-19	9	Negative.
2-25-19	10	Negative.
2-25-19	11	Negative.

EXPERIMENT II

Date of Autopsy	Pig.	Results
2-26-19	1	Generalized tuberculosis.
2-26-19	2	Generalized tuberculosis.
2-26-19	3	Generalized tuberculosis.
2-26-19	4	Tuberculosis of the inguinal gland on the injected side.

EXPERIMENT III

Date of Autopsy	Pig.	Results
2-21-19	1	Generalized Tuberculosis.
3- 5-19	2	Generalized Tuberculosis.
3-15-19	3	Negative.
3-15-19	4	Negative.
3-15-19	5	Negative.

EXPERIMENT IV

Date of Autopsy	Pig.	Results
12- 1-18	1	Negative.
2- 8-19	2	Generalized Tuberculosis.
3-19-19	3	Negative.
3-19-19	4	Generalized Tuberculosis.
3-19-19	5	Generalized Tuberculosis.
3-19-19	6	Generalized Tuberculosis.
3-19-19	7	An occasional hard tubercle in both lungs.
3-19-19	8	Negative.
3-19-19	9	One hard tubercle in the left lung.
3-19-19	10	Hard tubercle in the left lung.

fed in a sterile cage in another room. Both cages were scrubbed with "Neko" each day. The bath, however, was discontinued after the first week, as we felt that too much handling of the pigs would be injurious. On dissection, three of the animals were negative and seven showed tuberculosis.

An attempt was made to grow the organism from the dust on gentian violet egg medium. Five hundred tubes were inoculated but all were contaminated with spores.

SUMMARY AND CONCLUSION

Experiment I shows that dust material containing living tubercle bacilli can withstand drying and the effect of diffuse light and still retain virulence, and in sufficient numbers produce tuberculosis in a guinea pig.

The wards from which the samples of dust were taken are occupied by advanced, open cases of tuberculosis, many of these patients being of the middle and lower social strata. An attempt is made to prevent coughing with uncovered mouths and to observe other rules of cleanliness, but unless constantly watched, the rules are ignored. The wards floors are mopped daily with a strong solution of "Neko" and in some of the samples of dust and dirt collected, this could be detected by its odor. The bed clothes are changed daily, and it is our opinion that the cleansing of the wards is as thorough as is practical in public institutions. Theoretically, if the patients observe the rules carefully, the bacteria should not be scattered by the patients, but from the bare facts of the case, it would appear that it is extremely hard to prevent to some extent at least the scattering of the microorganisms. It emphasizes the importance or absolute necessity of housing advanced cases where this dissemination can be reduced to a minimum, and would suggest rather than prove that open cases of tuberculosis should not be admitted to the wards of a general hospital.

Experiments II, III and IV, indicate that blood and other organic matter coming from the body at postmortem, protect the organism from natural germicidal agents and that even the process of sterilization, using strong solutions of "Neko" and phenol, a number of bacteria will escape and remain virulent and can be blown around in dust, be inhaled by guinea pigs and produce tuberculosis.

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Kill two birds with one stone. Go get your new Member, and at the same time persuade him to go with you to the San Francisco A. P. H. A. Meeting, August 30-September 3, 1920.

EXCESSIVE MORTALITY FROM INFLUENZA-PNEUMONIA AMONG BITUMINOUS COAL MINERS OF OHIO IN 1918

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THE dearth of mortality statistics is probably the most disappointing feature associated with the study of disease in its relation to occupational employment. Among other obstacles which stand in the way of gathering reliable mortality statistics the following may be mentioned: (1) The relatively few occupations in which employment remains fixed; (2) the difficulty of obtaining figures representing race and age distribution and the number employed in the various occupations; (3) the prevalent carelessness with which occupational data is noted on death certificates, and (4) the infrequency with which the occupation of the deceased is recognized and assigned as a direct or predisposing cause of death.

There are a few occupations such as coal mining, pottery working, printing trades, etc., in which there is little disposition to occupational shifting. For some of these occupations it will be possible in the near future, we believe, to overcome the most serious obstacles which now stand in the way of the preparation of mortality statistics for the state of Ohio.

The Department of Investigation and Statistics of the Ohio Industrial Commission has for six years been compiling the annual statistical returns required by law of Ohio employers. These returns while at first incomplete are becoming more perfect each year and even now represent quite accurately the number employed in a few of the trades, more accurately in all probability, than can be expected from the Federal Census enumerators.

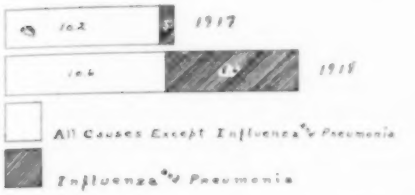
Unfortunately it has not been found feasible as yet to gather statistics of race and age distribution in any of the trades. However, even this may be accomplished in due course, and the Commission now has under consideration the question of including on its schedule an item regarding the race of the employed. Many employers are now keeping individual records showing the race and age of employes and the custom is becoming more general each year. A few of the highly organized trades are likewise keeping systems of records which in time should prove valuable in compiling mortality statistics. An instance of the latter is the United Mine Workers organization in the state of Illinois. This organization has for the past ten years kept account of the number of coal miners in the state, and in addition, a complete record of each death as a prerequisite to the settlement of death claim insurance maintained by the state organization. It was these records that enabled Hayhurst[1] to include in his Survey of Coal Mining in Illinois and Ohio a study of mortality among the Illinois coal miners.

This Department and the State Bureau of Vital statistics are now planning to carry on a campaign among undertakers of the state to interest them in the important matter of inquiring into and more accurately noting the occupational data on death certificates, and it is the purpose of the Bureau hereafter to scrutinize more carefully that portion of the death certificate provided for occupational

1. Hayhurst, E. R.: *Report of the Health Insurance Commission, State of Illinois*, May 1, 1919, pp. 376-402; *Journal of Industrial Hygiene*, 1, No. 7, (November), 1919, pp. 360-367.

data, and to discourage the use of meaningless terms. Though the fruits of such efforts may be long delayed and imperfect, even slight improvement in such fundamental data should appreciably enhance the value of Ohio's statistics.

CHART I



Illustrative of the Influenzal Factor in the Death Rate Among Bituminous Coal Miners of Ohio

From statistical returns obtained by the Industrial Commission and through the almost complete unionization of the bituminous coal miners, we have a pretty accurate annual count of the number of Ohio coal miners in employment. Both of these agencies agree on the figures 51,286 and 53,092 as representing with a considerable degree of precision the number of coal miners in Ohio in 1917 and 1918 respectively. This would seem then to furnish an occupational group as well suited for study as any at present.

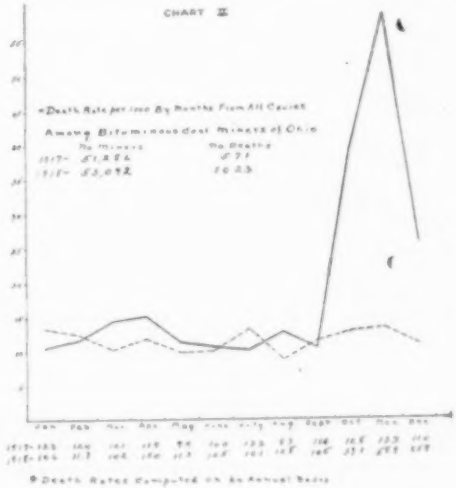
No attempt will be made to draw any conclusions from the attached tables because of the limited period covered, except that the striking mortality from influenza-pneumonia among Ohio coal miners in 1918 would seem to justify their presentation at this time.[2]

"The coal fields of Ohio lie in the eastern part of the state, extending from near the shore of Lake Erie in Geauga and Lake counties south-westward to Scioto and Lawrence counties on the Ohio River. An area of about 12,650 square miles, nearly one-third of the state, is underlain with coal-bearing rocks." Bituminous or soft coal only is mined. The population is chiefly rural.

The total deaths from all causes among Ohio coal miners in 1918 was 1,023, a rate of 19.2 per thousand employed, as against a total in 1917 of 571 deaths or a rate of 11.1 per thousand employed. The latter rate is not far from that found by Hayhurst[1] among Illinois coal miners for the six and one-half year period, February 1, 1912, to July 21, 1918; namely, 10.8 per thousand employed.

Of 39,565 deaths from all causes among males 15 years of age and over, in Ohio in 1918 (excluding coal miners), 11,989, or 30.3% were due to influenza-pneumonia, whereas 458 deaths or 44.7% of the total deaths among Ohio coal miners were due to influenza-pneumonia. Though these percentages certainly indicate a preponderance of influenza-pneumonia mortality among coal miners they do not in themselves represent the true relation when one considers the distortion resulting from the large mortality among

CHART II



2. Louis I. Dublin, Statistician, Metropolitan Life Insurance Company, has recently published figures representing mortality from influenza-pneumonia among bituminous coal miners, based upon 64 deaths occurring among 4,700 insured miners in the period October to December, 1918. *Journal Industrial Hygiene*. Vol. I, No. 10 (Feb.) 1920, p. 493.

miners due to deaths from violence. By reference to Table I it may be seen that 20% of the total deaths among miners in 1918 was due to violence, whereas only 8.7% was due to the same cause in males of 15 years and over in the state at large. By eliminating this distortion,[3] due to violence, the relation betwen influenza-pneumonia mortality percentages in coal miners and males of the state at large appears in a truer light. The percentage of total deaths due to influenza-pneumonia among coal miners is then 55.9 as against 33.1 among males of 15 years and over in the state at large.

3. Figured by computing the percentages with deaths from violence excluded.

If one may hazard the statement of a death rate from influenza-pneumonia among males of 15 years and over, in the state at large (excluding miners), based upon an estimate of 1,886,000 males,[4] we may compute a rate of 635 per 100,000 as against a rate of 862.6 per 100,000 from the same cause among miners.

Of the total deaths from influenza-pneumonia among coal miners, 17% occurred in the age period from 15 to 24 years, 37% in the age period 25 to 34 years and 28% in the age period 35 to 44 years. Eighty-three per cent of

4. Arithmetically computed as of July 1, 1918, upon the growth in population of this group between the 1900 and 1910 census.

DEATHS AND DEATH RATES AMONG BITUMINOUS COAL MINERS OF OHIO BY SELECTED CAUSES

1917 and 18

TABLE NO. I

Cause of Death	International List Numbers	No. of Deaths Coal Miners		Per Cent of Total Deaths Coal Miners		Per Cent Total Deaths Among Males 15 yrs. & over State at Large*	Death Rate per 100,000 Coal Miners Employed	
		1917	1918	1917	1918	1918	1917	1918
Typhoid Fever	1	10	14	1.7	1.3	0.9	19.5	26.3
Tuberculosis All forms	28-35	48	66	8.4	6.4	9.7	93.4	124.8
Cancer	39-41 43-45	29	28	5.1	2.7	4.5	56.5	52.7
Apoplexy & Other Diseases of Nervous System	60-76	54	58	9.4	5.6	10.2	105.2	109.2
Cardio Vascular Diseases	77-85	106	93	18.5	9.1	14.4	206.6	175.1
Influenza and Pneumonia	10 & 91-92	45	458	7.9	44.7	30.3	89.6	862.6
Other Respiratory Diseases	86-90 93-98	11	8	1.9	0.7	1.1	21.4	15.0
Genito Urinary (Non-Venereal)	119-127	33	29	5.7	2.8	7.2	64.3	54.6
Suicide	155-163	15	12	2.6	1.1	1.3	29.2	22.6
Other Violence	164-186	165	205	28.8	20.0	8.7	321.7	386.1
All Others	2- 9 11- 27 30- 38 46- 59 99-118 142-154 187-189	55	52	9.6	5.0	11.0	107.2	97.9
TOTALS		571	1023	99.6	99.4	99.3	1114.6	1926.9

*Exclusive of Coal Miners.

the deaths from influenza-pneumonia occurred in the age period 15 to 44 years. Of the total deaths in the age period 15-24, 57% died of influenza-pneumonia. Of the total deaths in the age period 25-34, 66% died of influenza-pneumonia. Of the total deaths in the age period 35-44, 54% died of influenza-pneumonia. The peak of the mortality curve came in November, a month later than that of the larger cities of the state.

For the two years under study the death rate from tuberculosis, cancer and Bright's disease were decidedly under the average for the U. S. death registration area, while the death rate from typhoid fever was nearly twice and that from violence, more than three times that of the registration area. The most conspicuous factor in the high death rate due to violence among Ohio coal miners is ascribed to "Traumatism in Miners" and "Railway Accidents," there being 121 deaths from these causes in 1917 and 161 in 1918.

Of the less conspicuous causes of death among coal miners during 1917 and 1918 the following may be mentioned: Four deaths due to dysentery; 2 to erysipelas; 2 to rheumatism, 8 to diabetes; 1 to exophthalmic goiter; 8 to aenemia; 19 to alcoholism; 4 to meningitis; 4 to tabes dorsalis; 13 to general paralysis of the insane; 5 to other forms of mental alienation; 2 to epilepsy; 4 to asthma; 5 to appendicitis; 4 to hernia and 19 to cirrhosis of the liver. There were no deaths in either year ascribed to malaria, tetanus or occupational poisonings.

It is our expectation as circumstances permit, to develop further mortality statistics for Ohio coal miners and for other occupational groups which may lend themselves to such purposes.

DEATHS AMONG
BITUMINOUS COAL MINERS OF OHIO
BY SELECTED CAUSES AND AGE GROUPS

TABLE No. 2.

Cause of Death	International List No.	Number of Deaths		15-24		25-34		35-44		45-54		55-64		65-74		75-84		85 and over		Unknown	
		1917	1918	1917	1918	1917	1918	1917	1918	1917	1918	1917	1918	1917	1918	1917	1918	1917	1918	1917	1918
Typhoid Fever	1	10	14	2	5	5	5	-	3	3	1	-	-	-	-	-	-	-	-	-	-
Tuberculosis All Forms	28-35	48	66	5	8	10	14	9	14	7	15	11	8	5	4	1	1	-	1	-	1
Cancer	35-41 43-45	29	28	-	-	-	4	4	3	6	7	13	4	4	8	2	2	-	-	-	-
Apoplexy & Other Diseases of the Nervous System	60-76	54	58	1	1	3	3	5	8	13	8	5	12	16	15	7	11	4	-	-	-
Cardio Vascular Diseases	77-85	106	93	4	4	6	3	13	9	20	14	22	24	26	28	10	9	5	2	-	-
Influenza and Pneumonia	10 and 91-92	45	458	1	80	2	179	9	129	15	28	7	25	6	21	3	3	2	2	-	-
Other Respiratory Diseases	86-90 93-98	11	8	-	-	-	-	2	-	1	2	3	-	2	4	3	1	-	1	-	-
Genito Urinary (Non-venereal)	129-137	33	29	-	-	1	-	1	6	4	8	8	4	12	3	7	6	-	2	-	-
Suicide	155-163	15	12	2	1	5	6	1	1	3	2	3	2	1	-	-	-	-	-	-	-
Other Violence	164-186	165	205	21	39	43	47	39	59	38	37	16	13	8	9	-	1	-	-	-	-
All Others	2-9 11-27 36-38 46-59 97-118 142-154 169-185	55	52	3	2	8	6	9	6	10	12	10	12	11	8	4	4	-	2	-	-
TOTALS		571	1023	39	140	83	258	92	238	120	134	98	104	91	100	37	38	11	10	-	1

EARLY SCHOOL OF PUBLIC HEALTH AT LYONS, FRANCE

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My attention has recently been drawn, by Professor Selskar M. Gunn, to an interesting pamphlet entitled "Instruction in Hygiene at Lyons," which is a reprint from the Revue d'Hygiene et de Police Sanitaire (p. 893), of last October. I wish that space permitted lengthy extracts from this important brochure, but I must content myself with a very concise account of it and refer those interested to the original paper. It may be helpful to some to remark that on the continent the term "hygiene" is used much as is in Great Britain and the United States, the term "public health."

"At a time when our country is exhausted by war, our population diminished by almost three millions in five years, and our birth-rate shows a decrease more painful than ever, in short, at a time when we must produce more Frenchmen besides preserving those which exist, the problems of Hygiene stand first among those interesting sociologists and physicians. How shall we teach Hygiene to physicians? How disseminate and popularize a science indispensable for the future of our country, that is our first problem"—so begins this historical document. The authors then proceed to set forth their views on the teaching of hygiene and show that public health has been sadly "neglected" in France, but that in 1900 Professor Jules Courmont established at Lyons a remarkable School or Institute of Public Hygiene and Health and enlivened its teaching.

Courmont was, apparently, a very unusual man, "an apostle of hygiene," for his leading idea was that hygiene is not only a medical but a social science, that "Hygiene overflows Medicine," that "The Professor of Hygiene must not confine himself exclusively to medical teaching, and that everything ought to be done in the way of such teaching "first for physicians, but also for specialists such as directors of bureaux and for those whose profession requires thorough knowledge of the subject," among whom are named architects and engineers. And Courmont not only established an Institute of Hygiene, but also a Museum of Hygiene, and what interests us particularly a *Certificate of Hygiene* based upon methodical and appropriate courses.

We need not dwell upon the Institute itself or the Museum or the methods of instruction, although in these last it is interesting to know that in 14 years 286 students have thus far been registered, 209 Certificates of Hygiene given and 209 specialists prepared for the different functions of laboratory work, officers of bureaux of public health, etc.

The courses upon which the Certificate in Hygiene is based are given in part at the Veterinary School, in part at the Law School, in part in the Faculty of Science, and in part by the Faculty of Law. "Some Courses are given by chemists, others by physicians." "Hygiene overflows medicine."

The great point is that these improved courses are not only for physicians and medical students, but also for druggists, veterinarians, architects, engineers, chemists, inspectors of public health, etc. Jules Courmont wrote: "More and more the social function of the physician will be hygienic and prophylactic as well as curative." Again it is stated, "Against opposition met in the medical environment, Courmont insisted that a complementary education in Hygiene was necessary not only for physicians, but for all who, from their functions ought to be instructed in hygienic matters."

The certificate bears the title *Certificat d'Hygiène*, but after what has been said it will be obvious that it is really equivalent to the American Certificate in Public Health and those readers of the AMERICAN JOURNAL OF PUBLIC HEALTH who are interested in the development of schools of public health will perhaps be surprised, as was the author of this article, to learn that what is virtually a *Certificate in Public Health* was established in Lyons as early as 1905, and that in 1919 209 persons had received the certificate, 135 having been physicians or medical students and 74 non-medical men—pharmacists, chemists, architects, engineers, etc.

DISCUSSION OF "A STANDARD BUDGET."

Discussion of Dr. Haven Emerson's paper,* "A Standard Budget: the Health Officer's First Need," before the Section on Public Health Administration, American Public Health Association, at New Orleans, October 28, 1919, by *Ernst Christopher Meyer, Ph.D.*, of the International Health Board, New York City.

Several points touched upon in Dr. Emerson's excellent summary of the importance of a standardized budget deserve emphasis. Standardization means little without a degree of universality in the use of a standard. A standard of weights and measures, for example, is useful only if it is very generally adopted. The same is true of the standardized health budget. During recent years much progress has been made in the standardization of budgets in our cities. Nearly two-thirds of our states also have already adopted so-calied standardized methods of budgeting. The movement is gaining headway rapidly. The method used in the past will, however, not produce the results which are sought by those who have in mind general uniformity in budget making. The budget systems adopted in the several states are not constructed on a standardized plan as between the states. The classifications of the functions and objects of expenditure used in California differ from those used in Wisconsin. The classifications used in Wisconsin differ from those used in Maryland, and so on. The result of this lack of uniformity is that comparative statistics on expenditures as between the particular states concerned are not produced by accounting methods based on the present standardized budget plans of these states.

What the state governments have had in mind in introducing standardized budgets is standardization of the procedure as between the different departments and bureaus of the particular state government concerned. This is in itself, of course, an immensely important matter. Standardization of method for this purpose is valuable, but the large benefits of standardization cannot be enjoyed unless there is coöperation and mutual agreement expressed in the adoption of a uniform budget by the different state governments, or by the different cities, not only within a given state, but throughout the country.

Without such uniformity of plan, comparatice statistics can not be produced. The value of standardization depends upon the possibility of comparison. Our standards of efficiency and of cost of work are relative standards. There are no absolute standards either of the cost of health work or of efficiency. It can not be said, for example, that it should cost just $1.03 per day to maintain a patient in an isolation hospital. It is only by comparison of the cost and service between different institutions that a relative standard can be established. This point must be emphasized as the present movement towards standardized budgeting in all state governments wholly overlook it. A great deal of work will need to be done over again when the necessity of uniformity, at least along the broadest lines of classification, comes to be more generally recognized.

The point in question is well illustrated by the experience of the U. S. Bureau of the Census through its Division of Statistics of Cities and States which annually encounters great difficulties in the collection of financial data dealing with receipts and expenditures. Trained accountants of this division are compelled to spend from a few weeks to a number of months in various cities gathering up from the public records the details of financial statistics and juggling them into some form of uniformity of arrangement. To do this work it is often necessary to go back to original vouchers and to detailed accounts to re-classify the information and to adapt it for use in the uniform comparative plan of presentation that the Census Bureau has adopted.

In spite of the fact that many cities have adopted standardized budgeting and have good systems of accounting, the lack of uniformity as between the cities makes it exceedingly difficult to get the necessary data.

The result of this nation-wide work, it may well be emphasized. Here is the production of the only comparable statistics on expenditures for health work in the country with the exception of those issued by a few state agencies, notable among which is the Municipal Division of the Bureau of Statistics of the State of Massachusetts. Statistics of cities

*For Dr. Emerson's paper, see A. J. P. H., March, 1920, page 221.
For Dr. Meyer's paper, "Methods for the Defense of Public Health Appropriations," see A. J. P. H., March, 1920, page 201.

have appeared annually since 1902; those of states since 1915. Statistics of cities cover all cities of 30,000 and over. Statistics of cities of 8,000 to 25,000 appeared in the report on Wealth, Debt, and Taxation of 1902, and in a special report for cities for 1903. In 1903 and 1913, statistics of cities of 2,500 and over were published in Wealth, Debt, and Taxation and in 1913 also in the report on Municipal Revenues, Expenditures, and Public Properties.

The volume on Statistics of Cities for 1917, by way of illustration, contains 373 quarto pages. We find here a classification of the expenditures of city governments for all purposes in minute detail. Those concerning health conservation are given under the following headings:

I Health Department Administration
II Vital Statistics
III Prevention and Treatment of Communicable Diseases
  1. Tuberculosis
  2. Other communicable diseases in hospitals
  3. Other treatment of communicable diseases
IV Conservation of Child Life
  1. Medical work for school children
  2. Other conservation of child life
V Food Regulation and Inspection
  1. Milk and dairy control
  2. Other food regulation

Under the present budgetary legislation health officers are in a position to introduce classifications of functions and of objects of expenditure without interferring with the broad outline of uniformity called for under the law. It is possible, therefore, for health officers to come to an agreement to introduce the necessary uniformity as between the cities and the states. The Committee on Uniform Accounting* can be a steering committee in this work. The classification of functions and of objects of expenditures as agreed upon by the Advisory Committee which is provided for in the report of the Committee on Uniform Accounting to the present session of the American Public Health Association will be brought to the attention of health officers and may be used by them for their guidance in the preparation of future budgets.

Just one other point should be emphasized. The installation of the systems of uniform accounting even on a broad basis of uniformity as suggested above will be largely sterile of results unless the standardized presentation of facts in the reports prepared by health officers follows. Without standardized reporting the information produced by uniform systems of accounting will not appear before the public in comparable form.

It is necessary, too, in providing for such standardized reporting that the physical statistics of work done be presented on a uniform basis so that the units for the measurement of cost and efficiency may be properly developed through the correlation of standardized financial statistics of the cost of work and standardized physical statistics of work done.

*See Report. A. J. P. H., Feb., 1920, page 172.

HEALTH CENTER AT THE JACKSON SCHOOL, BRIDGEPORT, CONN.

These mothers are Hungarians.

FIRST CONFERENCE OF NEW SURGEON GENERAL, U. S. P. H. S.

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Many public health officers will recognize most of the staff of assistants in conference with Dr. Cumming. Left to right, sitting: Dr. J. W. Schereschewsky, Dr. J. C. Perry, Dr. Hugh S. Cumming, Dr. C. C. Pierce, Dr. W. G. Stimpson. Left to right, standing: Dr. R. H. Creel, Dr. A. J. McLaughlin, Dr. B. S. Warren, Dr. Charles Bolduan.

HEALTH WORK IN BRIDGEPORT, CONN.

This is one of the Health Stations in Bridgeport, Conn., and gathered here is a group of Italians assembled at the local center, which is homed in the Waltersville schoolhouse. These mothers can attend a clinic, which is in touch with the central one of the Health Department, and they gather here for little talks by the nurses on health essentials.

EDITORIAL SECTION

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RED CROSS AND PUBLIC HEALTH WORK.

One of the objects which every competent public health official seeks to attain is the establishment of an enlightened public opinion leading to the support and co-operation of all the citizens. This is one of the most difficult problems of all health administration on account of the human factor involved. It is human nature to seize on all incidents, no matter how trivial or perverted, which offer a support for condemnation or abuse. On the other hand, credit is seldom placed where it is due and justly merited. In many communities the only persons who support the health officer wholeheartedly are those who are themselves concerned with health, such as members of the medical profession or private social and health agencies. Yet even such agencies not infrequently are lined up against the public official rather than in his support.

Sometimes there is just cause for opposition to the health authorities, especially when they are admittedly incompetent, or under the influence of politics. Such influence is likely to cease only when the public acquires a knowledge of the principles underlying good health administration. This knowledge is to be gained through various agencies and the foremost health administrators set a high value on work in health education.

With the entry of the American Red Cross into the field of public health, it would seem as if there were an excellent support for the health officer and means for the education of the people ready made to order. The organization clearly sets forth the offer of its services, in co-operation with existing public health bodies, without desire or effort to supplant them or usurp their duties. As a supplementing body it has almost unlimited opportunities. It recognizes the necessity of administering public utilities by public health officers and it plans to work with that in view.

The American Red Cross has enunciated a plan for the co-ordination of official and extra-governmental health work, that seems to be well-considered,

sound and practical. It seems as if it might be the cement that can bind together all these agencies, for it has had wide expecience, it has the machinery of organization and it has gained the sympathy and support of the people. As a force in the health education of the American citizen and in the interests of the "team play," which is to accomplish results, the American Red Cross has an extraordinary opportunity.

ADVERTISING OF DISINFECTANTS

One of the effects of the influenza epidemic was the boom in the disinfecting business. It was a common thing to see disinfectants advertised along with Father John's Medicine and other cure-alls as preventives of influenza and pneumonia.

As a result of the advertisements, many a householder was led to "disinfect" his garbage pail, closet bowl, sinks, and floors, with the greatest assiduity.

Any one who has studied the etiology of the respiratory diseases, knows that these measures are not worth anything so far as preventing the disease is concerned. While we know very little concerning the practical measures for preventing influenza, we know positively that it is not transmitted by means of garbage pails, sinks, closet bowls, and floors—and we have no doubt that the manufacturer of disinfectants knows this also.

There is a measure of reasonable doubt in the case of the use of throat disinfectants as a preventive, although authorities seem to be pretty well agreed that the practice is not helpful and is perhaps harmful in some instances. It may be placing somewhat of a strain upon the instincts of a commercial manufacturer to ask him to refrain from advertising products concerning the utility of which the medical and public health professions are merely in doubt, in which the manufacturer, however, has faith. But no honest person, whether manufacturer, advertising agent, or sanitarian, can sanction the advertisements which have appeared and seem to thrive after the epidemic like sharks at a shipwreck.

The sale of these disinfectants for unwarranted purposes is not merely a swindle; it is harmful in that it creates false ideas concerning the transmission of disease and concerning the means of preventing it. The person who relies upon disinfectants must first have that obsession removed before he can be taught the really effective modes of avoiding infection. It is pretty difficult to teach a person to avoid the fresh nose and throat discharges of a scarlet fever patient when every newspaper screams forth a warning to beware of filth in sinks and garbage pails.

Many a health department is compelled to dissipate its funds in the ceremony of fumigating rooms after scarlet fever, diphtheria, and whooping cough, when the money could be spent to much better advantage in teaching people not to use common drinking cups, and to avoid the sneezes of others.

The American Public Health Association is sending a circular letter to advertising agents and to manufacturers of disinfectants, informing them that war has been declared against the unwarranted claims concerning disinfectants. Health officers will do well to supplement these efforts whenever possible in their health bulletins and their public addresses.

In Memoriam

EDOUARDO LICEAGA.

News has just been received in this country of the death of Dr. Edouardo Liceaga, of Mexico City, former president of the American Public Health Association, and, in these later years, honorary member.

It was in 1889 that a delegation of officials of the Federal Board of Health of Mexico first attended as guests the annual meeting of the American Public Health at Charleston, S. C. In 1890 Mexico was admitted into the Association and Dr. Edouardo Liceaga, president of the Federal Board of Health of Mexico, then first appeared as one of the delegation. In 1892 the association held its annual sessions in Mexico City and received the most magnificent entertainment probably ever accorded to it. The general director in all this illustration of the attention being extended to public health in Mexico by the government then existing, was Dr. Liceaga, the president's personal friend and physician; while the members of the American Public Health Association were made to appreciate fully the true meaning of the Mexican welcome, which says that "the house is yours."

Dr. Liceaga was a statesman in the truest sense of the word, and realized that the prosperity of Mexico depended upon freeing her seaports from the danger of epidemic diseases and the opprobrium of yellow fever. On the East lay Vera Cruz, the post of entry to Mexico, notorious as a pestilential swamp, breeding malaria and with yellow fever endemic there. To this problem Dr. Liceaga and his Board directed their first energies, determined to solve the problem of maritime sanitation. In the City of Mexico, on the other hand, situated within a basin of the table land, engineers were set the task of lowering the ground water to some eight feet below the ancient city, the Venice of Montezuma, by boring the Notchistonga tunnel through the mountain rim. Within a few years the seaport of Vera Cruz saw constructed miles of concrete breakwater, the city had been drained, streets paved and sewered and a splendid water supply brought in for miles from the mountains. All the ideas known to modern quarantine were adopted at the port. A weekly bulletin of the presence or absence of yellow fever was published by the Federal Board and modern sanitation in the best sense was established as a daily routine.

The American Public Health Association again visited Mexico in 1906 and those that then passed in at the eastern gateway, Vera Cruz, found there a beautiful seaport, with rapidly developing foreign trade, with yellow fever and malaria only remaining as a memory; while in the City of Mexico the ground water had been lowered, typhus fever had disappeared, new colonies or towns had been planned, areas had been extended, and the old city of 200,000 population had become the modern city of 400,000, boasting of one of the most beautiful locations and urban developments on the continent of America.

These two works which illustrated the two principal permanent public sanitation works of the government, were followed by sanitation generally extended to the other towns and districts of the several states of the Republic. Model general hospitals were constructed, through encouragement of municipalities by the Government, while medicine as well as sanitation were being ever modernized largely through the practical wisdom of Dr. Liceaga. Physical training became a routine in the schools of the country, while charities were enlarged, prisons and reformatories improved, and modern progress of a social sort was continually moved forward through the efforts of the Federal Board of Health. Dr. Liceaga became vice-president of the American Public Health Association in 1893, and president in 1896, and for many years

took a most active part in the work of the Executive Council of the Association. Scarcely a year passed which did not have a paper presented by Dr. Liceaga, or a report of some important phase of public health within the Mexican republic. Dr. Liceaga was ever fertile in methods for extending the field of applied sanitation and was proud to report Mexican advances in every department of public health.

During the last ten years of Dr. Liceaga's life, national misfortunes and personal losses deprived the association of his welcome presence, to which were added the inhibitions of failing health and advanced years. In Dr. Liceaga the Association beheld the finest example of Latin dignity associated with that courtesy and affability spontaneous in the cultural Spanish gentleman, and in his loss, as that of Dr. E. Pelletier of Montreal, last year, the American Public Health Association is not only made conscious of its fifty years of age, but also that other times and other manners are year by year dominating more and more its procedures and meetings. We have with us still Dr. Stephen Smith, Dr. Holt and Dr. Montizambert; but the days of *les grande seigneurs* are rapidly passing. We may replace general culture by more exact scientific knowledge, and wide generalizations by the statistical precision of modern days; but the Association will suffer real loss if in these high pressure days, that true courtesy and those delicate attentions which constitute the gentlemen of the type of Dr. Liceaga, are allowed to disappear in the "Sturm and Drang" of modern competition.

To the family of Dr. Liceaga, those members of the Association who had the privilege of knowing him, will extend their most sincere sympathy; while every member of the Association will send to Mexico and our members there, condolences upon the great national loss which it has sustained through the passing of their most renowned leader.

BOOKS AND REPORTS REVIEWED

Anaphylaxis and Antianaphylaxis. *Dr. A. Besredka, Prof. Pasteur Institute, Paris. Prefaced by Dr. E. Roux, Director of Pasteur Institute, Paris. English Edition by S. Roodhouse Gloyne, M.D., D.P.H., London, England.* St. Louis, Mo.: C. V. Mosby Company, pp. 143. Price $2.25.

There is hardly anyone more competent to discuss the subject of anaphylaxis than Dr. Besredka. With the ever-increasing practice of serum and vaccine therapeusis, the subject is bound to gain in importance, and any scientific contribution coming from such a source should be carefully scrutinized by the profession. Rarely has a term been so often misapplied as the term "anaphylaxis." A bewildering amount of literature has a tendency to confuse the mind of the student who is not in a position to follow the subject systematically. A bird's-eye view of it is therefore very welcome.

The rich experimental experience of the author supplies the text with a personal flavor not common to publications of this character. The foreign literature is not overlooked, however, and altogether this publication may be safely put down as the latest compilation of everything pertaining to this intricate subject. The last chapter, VIII, is written by S. Roodhouse Gloyne and deals with the "Recent Work on Anaphylaxis." Chapter II deals with the historical development.

References are richly supplied.

ARTHUR LEDERER, M. D.

Child Welfare in Kentucky. *An inquiry by the National Child Labor Committee for the Kentucky Child Labor Association and the State Board of Health. Edward N. Clopper, Ph.D., New York City: National Child Labor Committee. Pp. 322. Price $1.25.*

Improvement of health conditions in Kentucky (and such betterment is typical of what should be undertaken in many states) is urged in the recommendations for a state program made by the National Child Labor Committee for the Kentucky Child Labor Association and the State Board of Health. The account of this investigation made under the direction of Edward N. Clopper, Ph.D., and published under the title "Child Welfare in Kentucky," is one of the most valuable publications of its kind yet issued. It does not blink at the dark and disgraceful facts that stand to the discredit of many communities of an old American state, and yet it sees evidences of a public disposition to correct these evils. The director thinks it worth while to make detailed recommendations for a broad health program.

These provisions have been suggested in a special chapter on health by H. H. Mitchell, M. D., in which the laws of health as they relate to human life everywhere are admirably summed up. What Dr. Mitchell would do in Kentucky "for such growth of the public service as will protect the health and develop the capacities of her children," would be a valuable program for similar constructive action in almost any American state. Her plan in brief calls for State Bureau of Child Hygiene, to put into practice those provisions for care of mothers and babies that are well understood in the medical profession and too often neglected by the general public. This includes prenatal centers; extension of the services of public health nurses; closer supervision of midwives; establishment of maternity hospitals or wards in general hospitals; better vital statistics; children's health centers; health propaganda; physical examination and correction of defects among young school children; hygienic school houses and other evident necessities for healthful childhood.

Unless such health recommendations as have been outlined with wonderful clearness in this report can be put into effect in the near future, the outlook for Kentucky children would not seem to be very promising. As Dr. Clopper indicates "Kentucky neglects her children," or at least has done so up to now. The investigation shows a state in which about 1,200,000 are being brought up, 80% in rural districts. These are subject to more diseases than affect the children in large and congested cities. Many of them live in primitive houses with polluted water supply. The rural schools in general are none too good. A child labor law —one of the best in the country—is on the statute books, but in most places it is not enforced because of lack of inspectors. Marriage of girls of twelve years old, and boys of fourteen, is permitted with consent of the parents. The condition of childhood, in brief, in all too many communities of the state is "aggravated by disease, deformity and illegitimacy."

This unfortunate situation, which is not at all peculiar to Kentucky, cannot be ignored in any child welfare report. One is glad, nevertheless, to find that this document is far from being fault-finding; it is not critical of the good people of the state, but finds them too often complacent and satisfied with the way things have been done. At the same time many Kentuckians are awake to the need of better protection for the children of the state and the investigating committee was given a cordial welcome on the part of the Commonwealth by Governor A. O. Stanley.

The separate chapters of the report cover such topics as schools, by Elizabeth Bliss Newhall; recreation, by Raymond G. Fuller; rural life by Charles E. Gibbons; child labor, by Loraine B. Bush; juvenile courts, by Mabel Brown Ellis; and law and administration, by W. H. Swift. These chapters contain so much specific and unusual information of a vital character that the report should be in every library of the country and in the hands of every public officer.

MAY BLISS DICKINSON, R. N.

✝

Public Health and Reconstruction.—*Report of the Public Health Committee of the New York State Reconstruction Committee*, October 24, 1919.

This excellent and comprehensive report is divided into six sections as follows: I, Individual and Public Health; II, Health of the Child Before School Age; III, Health of the School Child; IV, Health of the Young Adult; V, Health Insurance, and VI, Recommendations.

The first section is introductory.

Under section II the need for prenatal care is discussed and it is stated that maternity centers and visiting nurses are the best means to overcome ignorance and lack of care of prospective mothers. Stricter requirements for midwives are urged and the need for clinics and child welfare stations is stressed.

The third section gives a resume of present medical inspection of school children in the state and of the child welfare work of the State Department of Health and the municipalities of New York. Nutrition is discussed and the conclusion reached that too many children are under nourished. School lunches are urged. The importance of playgrounds for schools is set forth and better school sanitation is also urged. It is stated that an active campaign of education is the first essential in any plan for reconstruction and that health education to be successful must begin in the school room.

The discussion of the health of the young adult, to which nearly half of the pamphlet is devoted, is further divided into the following topics: (1) The general health of young male adults; (2) Pulmonary tuberculosis, (3) Pneumonia, (4) Typhoid fever, and (5) The venereal diseases.

The data are taken largely from the draft statistics. The New York rejections show, in general, that city men suffer more from alcohol and drugs, developmental defects, diseases of the ear and eye, flat foot, hernia and tuberculosis. In the rural districts there is a preponderance of disease of the bones and joints, venereal, genito-urinary diseases, bad teeth and diseases of the thyroid gland. The army experience shows the necessity of frequent physical examinations. The committee mentions the need for reorganization of health districts and expansion of the state department of health. More institutional care for tuberculosis is asked for. It is stated that only the well-to-do and the charity patient can avail themselves of proper nursing facilities. Health Centers, which aid and correlate all existing agencies, are strongly urged and where lack of funds prevents such organization, the State should assist.

Health insurance is endorsed and the committee states its belief that the Davenport-Donohue health insurance bill will give to workers of the state a measure of essential and enforcable health protection.

Among the recommendations not already cited are: A plan of boarding out destitute children on the unit system, using the institutions which exist as clearing houses; adoption of ordinances requiring pasteurization of milk; appointment in every school district of a full-time health officer who shall have full charge of all the health work; stringent child labor laws; maintenance in every one of the larger cities of a public health laboratory; support of the national program for combating venereal diseases by liberal appropriation from the State and local municipalities; continued support by the State of the Institution for the Study of Malignant Diseases at Buffalo.

The chairman of the committee is Dr. Henry Dwight Chapin. J. A. T.

✝

Tubercle, the new English magazine (83-91 Great Titchfield St., London), is performing an excellent service in assembling the news with reference to this disease from all the quarters of the earth. The January issue touches on the relationships to life assurance, war time, gaseous inhalations, and the industries, assembles facts and figures from Spain, the Malay States, and Egypt, presents notices of recent meetings, statements about hospitals and sanatoria, and sprinkles in a goodly seasoning of brief news items from everywhere. The Malay story states that the rate in Singapore was 4,840 per million of inhabitants in 1916 and in Perak, 2,170 per million in 1915. It is a disease on virgin soil where bovine tuberculosis is unknown, and out of 250,000 hogs slaughtered in the Ipoh abattoirs, not a single infected animal was found. Egypt is likewise a country with little immunity against the disease. The review in gaseous inhalations is a review of a report to the Medical Research Committee. It would appear that in certain trades in which gas is evolved had an unusual immunity among their employees from influenza. Experiments were tried which seem to confirm this fact. While it does not affect directly the tubercle bacillus, this treatment may lead to the control of secondary infections.

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The kitchen is the most important room in the house from a health standpoint, says the United States Public Health Service. Keep everything about it and every one in it scrupulously clean.

Health Centers. *American Red Cross.*

The American Red Cross has recently issued a twenty-page pamphlet entitled "Health Centers: A Field for Red Cross Activity." This pamphlet is the preliminary and general statement of a part of the peace-time program of the Red Cross, which is concerned with Public Health. It is the plan of the Red Cross to offer its services in assisting the establishment of health centers in those communities where they are needed. The demand for team play in Public Health is stressed and the health center is offered as the next step in the evolution of community welfare. The health center acts as a clearing house for Public Health information and offers opportunity to coördinate all the public and private activities which exist in a community. It is suggested that here should be housed the city health officer, his laboratory, and that space should be provided for various clinics such as infant welfare, tuberculosis, venereal disease, mental hygiene, dental hygiene and industrial hygiene, together with an auditorium which could serve as a meeting place for conferences and lectures and gatherings of local medical societies.

CONVENTIONS, CONFERENCES, MEETINGS

April 19-20, Charlotte, N. C., North Carolina State Health Association.

April 20-21, Greenville, S. C., South Carolina Medical Association.

April 20-22, Anniston, Ala., Medical Association of State of Alabama.

April 20-22, Charlotte, N. C., Medical Society of North Carolina.

April 22-24, Houston, Texas, Texas State Medical Association.

April 22-24, St. Louis, Mo., National Tuberculosis Association.

April 24-26, New Orleans, La., Louisiana State Medical Association.

April 26-30, New Orleans, La., American Medical Association.

April 29-30, Bismarck, N. D., State Nurses' Association.

May 4-6, Austin, Texas, Texas Graduate Nurses' Association.

May 4-6, Cedar Rapids, Iowa, State Dental Society.

May 10-15, Rosedale, Kansas, Kansas Health Officers' School and School for Public Health Nurses.

May 11, American Association of Eugenics.

May 11-12, Indianapolis, Ind., Indiana State Health Association.

May 12-14, Des Moines, Iowa, Iowa Medical Association.

May 12-14, Des Moines, Iowa, Trudeau Society.

May 20-24, Brussels, Belgium, Congress of Royal (English) Institute of Public Health.

May 24-26, Omaha, Neb., Nebraska State Health Association.

May 24-26, Omaha, Neb., Nebraska State Medical Association.

May 25-26, Toronto, Ont., Ontario Health Association.

May 25-27, Columbus, Ohio, Ohio Hospital Association.

June —, New Orleans, La., American Association of Industrial Physicians and Surgeons.

June —, Duluth, Minn., Minnesota Hospital Association.

June —, Cour d'Alene, Idaho State Medical Association.

June 1-4, Cleveland, Ohio, American Medico-Physiological Association.

June 3, Providence, R. I., Rhode Island Medical Society.

June 3-5, Portland, Ore., Oregon State Medical Association.

June 9, Boston, Mass., Massachusetts Medical Society.

June 15-16, Minot, N. D., North Dakota State Medical Association.

June 21 .., Vancouver, B. C., Canadian Public Health Association and five other Canadian National Associations.

June 21-25, Montreal, Can., American Water Works Association.

June 23-23, St. Paul, Minn., Catholic Hospital Association.

SURGEON GENERAL CUMMING DISCUSSES EUROPEAN HEALTH CONDITIONS

Dr. Hugh S. Cumming, the new Surgeon General of the United States Public Health Service, succeeding Dr. Rupert Blue, returned from his duties in Europe to assume his new position in Washington, arriving on March 10. For two years he has been abroad, sitting as the representative of this government on various international health boards and observing conditions of disease and public health. He has made especial study of the outbreaks of typhus raging in many Oriental countries.

With reference to this disease, Dr. Cumming notes that it is far from checked, but seems to be on the increase, and there is imminent danger of its invading Europe on a large scale, unless strict quarantine and other measures of control are enforced. Once intrenched in European ports, its next step would be across the Atlantic. Even if it should invade this country, Dr. Cumming does not think it would be difficult to keep in check, because of the essentially different living conditions here. Likewise, it is important the bubonic plague be kept out of the country. This is at the present time in practically all of the Mediterranean ports and constitutes a serious menace to this country.

With reference to the quarantine regulations of the country, the European authorities, according to Dr. Cumming, regard them with highest appreciation, and indeed they have been recommended for adoption by other nations.

As to international health relationships, the new Surgeon General of the Public Health Service stated that an agency would soon be established under the League of Nations which would coördinate and strengthen the health work of all nations, and would materially improve international reporting of diseases and the maintenance of quarantines. This matter is the subject of serious discussion at the meeting in London of April 12, one of the purposes of which is to formulate a permanent organization.

RUPERT BLUE

Former Surgeon General of the United States Public Health Service

Surgeon General Rupert Blue, since 1892 connected with the U. S. Public Health Service, is the son of John G. and Annie M. Blue, and was born in Richmond County, North Carolina, on May 30, 1867. After studies at the University of Virginia he attended the University of Maryland and received the degree M.D. in 1892. In 1909 this university conferred on him the degree D.Sc. Continuing his studies in Europe, Dr. Blue graduated from the London School of Tropical Medicine in 1893. In 1913 the University of Wisconsin conferred on him the degree D.Sc., and in the same year he was made D.P.H. by the University of Michigan.

Dr. Blue was elected President of the American Medical Association in 1915 and in the same year became President of the Association of Military Surgeons of the U. S. A.

The public career of Surgeon General Blue began with his entrance into the corps of the Public Health Service in 1892 as interne. The following year he was commissioned Assistant Surgeon by the President. In 1897 he was advanced to the grade of Passed Assistant Surgeon, and in 1909 was made Surgeon. On January 8, 1919, he was appointed by the President of the United States to the position of Surgeon General of the Public Health Service, in which position he has just been replaced by Dr. Hugh S. Cumming.

When the bubonic plague was detected in San Francisco in 1903-04, Dr. Blue was placed in charge of the eradicative operations in that city. His efficient service here led to a similar detail in 1907-08 when the disease again broke out in California. The energetic measures for the suppression of the disease which were inaugurated by him and the success that followed his vigorous campaign placed him in the fore-

most ranks of sanitarians in the country. Dr. Blue likewise served with distinction through the outbreak of yellow fever in New Orleans in 1905.

During his career in the Public Health Service Dr. Blue has served at stations of the service at Cincinnati, Galveston, Charleston, S. C.; San Francisco, Portland, Ore.; Milwaukee, New York, Norfolk, New Orleans and abroad at Genoa, Italy.

What has been accomplished under his leadership by the Public Health Service is noted elsewhere in this issue of the JOURNAL is a résumé of its work.

UNITED STATES PUBLIC HEALTH SERVICE

At this moment, when the term of office of Surgeon-General Rupert Blue, as head of the United States Public Health Service has terminated, and his successor has been named, it seems opportune to review briefly some of the accomplishments of the Service in the past few years.

The Public Health Service today is the evolution of a number of years, during which a series of Congressional enactments has increased from time to time its functions and changed its name.

From 1879 to 1902, the Service was known as the Marine Hospital Service. In the latter year Congress changed its name to the Public Health and Marine Hospital Service and greatly increased its function to keep pace with the progress of public health. From 1902 to 1912, the Service experienced a further period of expansion until in the year last named its name was changed to the Public Health Service and its public functions very materially broadened.

The early function of the Service consisted chiefly in rendering medical and hospital assistance to seamen of the merchant marine. However, the excellently trained personnel of the Service offered an agency through which public health studies and investigations could be carried on. This opportunity for progress had been recognized by Surgeon-General Blue for some years prior to his appointment to the office of Surgeon-General. Accordingly one of his first official acts after nomination was to urge upon Congress the enactment of a bill to change the name of the Service and increase its function and authority over public health matters. This bill, which became a law within eight months following Dr. Blue's appointment, vested full authority in the Public Health Service to "study and investigate the diseases of man and conditions influencing the propagation and spread thereof, including sanitation and sewage and the pollution either directly or indirectly of the navigable streams and lakes of the United States."

Since 1912 Congress has recognized the public health needs of the country to a greater extent than ever before. Under the progressive administration of Surgeon-General Blue the appropriations of the Service have increased steadily, making it possible to undertake much new work of great importance to the health of the country.

Following the law authorizing the Public Health Service to "study the diseases of man," etc., above mentioned, Congress appropriated in June, 1913, the sum of $200,000 for specifically carrying out this purpose. In 1917 this appropriation was increased to $300,000. Much scientific work of far-reaching importance has resulted.

In 1914, studies in industrial hygiene were begun to determine the sanitary conditions surrounding the factory workers of the country, and to collect statistics on the subject, in order that remedial measures might be taken where unsanitary conditions were noted. Much has been accomplished in this work.

Soon after his appointment to office, Surgeon-General Blue took steps to check the serious menace of malaria in the South. With the end in view of ameliorating these deplorable conditions malaria investigations were started in 1912. In some sections of the South, where malaria previously existed as a constant menace, the disease has now practically been eliminated, and in all sections proper methods have been demonstrated to the local authorities for its elimination.

With the increase of the public health functions of the Service, it became apparent that the facilities of the Hygienic Laboratory of the Service in Washington—at which all the laboratory work connected with public health studies is carried on—would necessarily be enlarged. Consequently the Surgeon-General requested Congress for increased appropria-

tions to take care of this situation, with the result that in June, 1913, $25,000 was appropriated for this purpose.

Another achievement lies in the effective work the Service has performed along the lines of interstate sanitation. Realizing that the effective prevention of epidemics is possible only when strict measures against their spread through the instrumentality of interstate traffic are enforced, Surgeon-General Blue began soon after his appointment to devise means to cover this heretofore untouched field. In fact, no other health agency has authority or could efficiently occupy this field and accomplish the work with resulting benefit to the whole country. At least two great epidemics have been checked in a comparatively short time by reason of the authority vested in the Service. Without this authority these epidemics might have spread and become national in proportions.

The U. S. P. H. Service demonstrated its value and its ability to make good use of its authority and its funds in the outbreak in 1916 of poliomyelitis. It has established a complete system of certification of drinking water used by interstate carriers, and to an extent has supervised the sanitation of the cars of the railways. Pellagra, studies in which were already instituted when Surgeon-General Blue was appointed, have been investigated with vigor under a special appropriation, the outcome being that the disease has been classed as a nutritional one, and means for its prevention, in a nourishing, well-balanced dietary, have been established.

One of the important pieces of work prosecuted by the Service has been the investigation of rural health conditions. For the first time a comprehensive survey of the conditions has been possible, and already much has been accomplished in ascertaining causes and in prevention. The leper has been another of the problems which the Service has undertaken to solve, and with funds at its disposal for a central home for these unfortunates is awaiting only the selection of the proper site for such a home and the construction of the buildings.

With the increase in the use of vaccines, viruses, serums, etc., in the prevention and cure of disease, it is evident that a pure and potent product is essential to the safeguarding of the health of the nation. Although by the Act of 1902, the Service was charged with the regulations of the sale and traffic in these products in interstate traffic it was difficult to enforce the law without funds to inspect the plants and the product and to determine by laboratory examinations and inspections whether the law was actually being complied with. Various appropriations have been made for this purpose. During the war this branch of the work was especially valuable.

The appearance of the bubonic plague in New Orleans in June, 1914, was the signal for active measures of repression, which were entirely successful. There were but few cases of sickness and death, and a disease which might have become epidemic in proportions was here quickly and quietly stamped out.

Of particular value was the work of the Service in dealing with the pandemic of influenza in the fall of 1918 which was imposed on the Service because of the entry of more than 30,000 physicians, practicing in the United States, into the military service. With the spread of the pandemic over the country urgent calls for assistance were addressed by stricken communities to the Public Health Service. Despite the dearth of physicians and nurses, Surgeon General Blue organized a mobile corps of nearly 1,100 physicians and a large number of nurses and detailed them to render the required medical attention to prostrated communities. To carry on this fight the Surgeon-General also asked Congress for $1,000,000, which was granted within a few days after the disease was recognized in epidemic form.

During the fiscal year ending June 30, 1919, the Bureau experienced the greatest expansion in its history. The executive order of July 1, 1918, centralizing all civil health activities connected with the war under the supervision of the Public Health Service was the forerunner of important and far-reaching legislation, namely (1) the act creating the Division of Venereal Diseases in the Bureau (contained in the Military Act of July 9, 1918), and appropriating $1,200,000 for the control of venereal diseases in co-operation with the States; (2) the Act of October 27, 1918, creating a Reserve Corps of the Public Health Service; (3) the Act approved November 1, 1918, appropriating $1,000,000 for the suppression of influenza, and, (4) the Act of March 3, 1919, authorizing the Public Health Service to provide hospital and sanatorium care for discharged disabled soldiers, sailors and marines. These enactments have contributed

greatly to the remarkable expansion of the Public Health Service, and it is believed that these health activities would have been permanently lost to the civil authorities if the suggested transfer of the Bureau to the War Department had taken place in 1917-1918.

Remaining as it did as a civil organization, the Service was able to render invaluable assistance to the country during the war period. Foremost among these activities may be mentioned its extra-cantonment sanitation, industrial hygiene, production and supervision of biological products, the campaign against veneral diseases, and as a result of the war, the medical and surgical relief to discharged soldiers.

Mention of the increased activities of the Service during the term of office of Surgeon-General Blue would be incomplete without pointing out a further piece of constructive legislation which became a law in October, 1918. The Act creating a Reserve Corps in the Public Health Service is now referred to. Without this authority to expand its regular corps in time of emergency, it is not believed that the medical care of the discharged soldier could be successfully carried on by the Service.

The greatest good accomplished by the Public Health Service in all of its spheres of operation, consists of the aid which the Public Health Service renders to the state and municipal health authorities, either directly or by the publishing of information relating to the prevention of diseases, which constitute a basis upon which these authorities can take necessary sanitary precautions in their respective jurisdictions.

There are, however, two outstanding accomplishments in this connection which warrant, it is believed, special mention:

(1) During the past eight years the Service has realized the great value to be derived from acting as a clearing house for information regarding the prevalence of diseases, and by the publishing of information in bulletin form each week all the state authorities have been kept currently advised of the appearance and progress of disease in the country, thus enabling them to more intelligently combat its spread.

(2) In a further respect the Public Health Service, it is believed, has rendered extremely important aid to the state and municipal authorities by detailing officers for the purpose of making surveys with a view to publishing the result of these investigations and recommending certain changes believed to be necessary and desirable to meet the needs of the respective localities.

The U. S. Public Health Service has good reason to look back with pride on its accomplishments under the leadership of Surgeon-General Blue.

CLINIC FOR SCHOOL CHILDREN AT BRIDGEPORT, CONN.

ASSOCIATION NEWS

HEALTH EMPLOYMENT BUREAU.

Help-wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the fifteenth of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Prosperous and growing city of the Middle West will require well equipped full time health officer. Salary to right man not less than $5,000 to begin. Address P. W. J., care of this JOURNAL.

Assistant chemist for sanitary analysis of water and sewage. Technical graduate with one year's experience or equivalent wanted. Work located in Chicago. Address 342, care of this JOURNAL.

A sanitary engineer for State Health Department. Desire a man familiar with water purification and sewerage practice and competent to examine plans and specifications. State training, experience, and salary expected. Address L. E. N., care of this Journal.

A nurse for industrial position in Chicago. State qualifications and references. Address 344, care of this Journal.

Competent man for position of sanitary engineer of State Board of Health. Usual duties, especially inspection and operation of water works, water purification and sewage disposal. Salary $150 per month. Address, with full record: Bureau of Engineering, Alabama State Board of Health, Montgomery, Ala.

Woman director for city laboratory. Salary to begin, $1,500. Address R. L. Carlton, City Health Officer, Winston-Salem, N. C.

Bacteriologist and Serologist for Cincinnati Health Department. Salary $2,000 to experienced man or woman. Work consists of bacteriological examination of diphtheria culture, Widal test for typhoid, sputum analysis, preparation of antigen and amboceptor and Wassermann test, gold curve, urinalysis, examination of fæces, spinal fluid, pneumococcus determination, examination of brain tissue for Negri bodies, etc. Address Wm. H. Peters, M. D., Health Commissioner, City Hall, Cincinnati, Ohio.

Two physicians for U. S. P. H. Service at the port of Boston. One temporary. Salary $150 to $200 per month. Address A. J. Nute, M. D., U. S. P. H. Service, Long Wharf, Boston, Mass.

A sanitary engineer for State Health Department. Man familiar with water purification and sewerage practice and competent to examine plans and specifications. State training, experience and salary expected. Address L. E. N., care of this JOURNAL.

A national organization interested in public health has openings for a number of properly trained public health experts. Duties are of organizing and advising in public health field. Salaries $4,000 or more. Physicians with experience in social and public health desired. In replying give full details as to training and experience. Address 343, care of this Journal.

The Texas State Board of Health offers unusual opportunities to nurses with public health training. A large and interesting field. County school nursing and community nursing. Pioneer work for the nurse with originality and initiative. Minimum salary $125 a month with a month's vacation on full pay. Address Mrs. Ethel Parsons, Dir. Public Health Nursing, State Board of Health, Austin, Texas.

A physician as medical assistant to Chief of Bureau of Venereal Disease Control, State Department of Health. Salary $2,400 per year with traveling expenses. Must be graduate of Class A, Medical school, with one year's internship. State license not required and experience not necessary. Address, Dr. A. J. Casselman, Chief, Bureau of Venereal Disease Control, 807 American Mechanic Building, Trenton, N. J.

Industrial physicians wanted. Salaries $2,500 to $3,000. State full particulars. Address 351, care of this JOURNAL.

Field Director rural sanitation in Southern state. Salary $2,700 to $3,600 with $800 expense allowance. Address 352, care of this JOURNAL.

CAMPAIGN FOR 7,500 A. P. H. A. MEMBERS

So closely is the future of the American Public Health Association related to a large and influential membership, that President Rankin has undertaken to advance the membership figure a step forward. Judging from the "drive" of last year, which carried the number of members and subscribers to the figure of 4,500, the goal set at 7,500 members and subscribers for the Membership Campaign of 1920, is not only a reasonable one, but one of comparatively easy attainment. It requires only that each existing member secure one new member, there being 3,600 members and 900 subscribers in the Association.

In the modern great movements, the potential qualities of the states are more and more recognized, and the evidences of this fact are not lacking in such matters as the coöperation of the U. S. Government with the state health departments in a number of important movements.

Following along the same line of thought, President Rankin has suggested and put into operation the 1920 Campaign for 7,500 members, enlisting the interest and invoking the aid of the health commissioners throughout the different states. This method of leadership gives especial local interest in the campaign. To lay out the work so that it might be most easily accomplished, quotas were named for the different states, figures approximately proportionate to the population.

In most of the states the State Health Officer has accepted the Chairmanship of the Campaign in that state. He has accepted the quota which the state is to raise, and he must rely on the A. P. H. A. members in his state to see that the goal is reached. In the few states where the State Health Officer found himself unable to be the chairman, the duty has been assumed by some other well known public health authority in his state.

In order to inaugurate the Campaign, President Rankin has addressed to each of the chairmen a letter of suggestion based on previous experience in the enlisting of new members. The chairmen will doubtless have individual plans for their respective states; for example, in those states where the annual conference of public health officers is due, a splendid opportunity will be afforded for setting forth before these specialists, the benefits of the A. P. H. A. In other states, where there are large cities, teams may be organized—a plan which proved very successful last year in some places.

Another letter goes forward from President Rankin to each member, giving him the name of his Chairman, and inviting him to serve on the State Committee. This will put him in touch with his Chairman, and have him prepared to name his member. Cards for nomination of new members will be enclosed to him.

State chairmen will always be in close touch with the Boston office and *vice versa*. In order to keep up the interest in the friendly rivalry between the states, reports will be collected and will be sent out periodically from Boston to all State chairmen. In some of the states the chairmen expect to send similar bulletins to members in their respective states.

States in the East will have their District Center in Boston, to which reports will be sent, and from which these will be distributed to the State chairmen. In the Far West, the Mountain and West Coast states, the District Center will be in the office of Dr. I. R. Bancroft, State Health Commissioner of California, who will care for the duties of this center in addition to those of California Chairman. His reports will be communicated to Boston by telegraph, and information for distribution will be sent to him by the same method. A similar center will probably be established in New Orleans for Southern states.

It is hoped to carry on the major portion of the Campaign during April, and to finish up by May 15th.

Future issues of the Journal and News Letter will show the results of the Campaign.

On the next page are presented the names of the State Chairmen of Committees. A few are missing, not yet having accepted the Chairmanship.

STATE CHAIRMEN OF CAMPAIGN COMMITTEES

Alabama—J. D. Dowling, M. D., Health Officer, Birmingham.
Alberta—W. C. Laidlaw, M. D., Provincial Medical Health Officer, Edmonton.
Arkansas—C. W. Garrison, M. D., State Health Officer, Little Rock.
California—I. R. Bancroft, M. D., State Health Officer, Sacramento.
Colorado—C. G. Hickey, M. D., President, State Board of Health, Denver.
Connecticut—J. T. Black, M. D., State Health Officer, Hartford.
Delaware—Mr. C. H. Wells, Special Health Commissioner, Wilmington.
Florida—R. N. Greene, M. D., State Health Officer, Jacksonville.
Georgia—T. F. Abercrombie, M. D., Secretary, State Board of Health, Atlanta.
Illinois—C. St. Clair Drake, M. D., Secretary, State Board of Health, Springfield.
Indiana—J. G. Royse, M. D., Director of Education, State Board of Health, Indianapolis.
Iowa—Prof. E. L. Waterman, State University of Iowa, Iowa City.
Kansas—J. J. Entz, M. D., President, Kansas Health Officers' Association, Hillsboro.
Kentucky—A. T. McCormack, M. D., State Health Officer, Louisville.
Louisiana—Oscar Dowling, M. D., President Louisiana State Board of Health, New Orleans.
Maine—L. D. Bristol, M. D., State Commissioner of Health, Augusta.
Massachusetts—B. W. Carey, M. D., Deputy State Health Commissioner, Boston.
Maryland—C. Hampson Jones, M. D., Health Officer, Baltimore.
Michigan—R. M. Olin, M. D., Secretary, Michigan State Board of Health, Lansing.
Mississippi—W. S. Leathers, M. D., State Director of Public Health, Jackson.
Missouri—G. H. Jones, M. D., Secretary, State Board of Health, Jefferson City.
Montana—J. J. Sippy, M. D., Epidemiologist, State Board of Health, Helena.
Nebraska—I. H. Dillon, M. D., Chief, State Bureau of Health, Lincoln.
Nevada—S. L. Lee, M. D., State Board of Health, Carson City.
New Hampshire—Mr. Carl O. Seaman, Health Officer, Manchester.
New Jersey—A. Clark Hunt, M. D., Chief, State Laboratory of Hygiene, Trenton.
New Mexico—C. E. Waller, M. D., P. A. Surgeon, U. S. P. H. S., State Commissioner of Health, Albuquerque.
New York—H. M. Biggs, M. D., State Health Commissioner, New York City.
North Carolina—W. S. Rankin, M. D., President, American Public Health Association, State Health Officer, Raleigh.
North Dakota—C. J. McGurren, M. D., Secretary, State Board of Health, Devils Lake.
Nova Scotia—W. H. Hattie, M. D., Provincial Health Officer, Halifax.
Ohio—A. W. Freeman, M. D., State Commissioner of Health, Columbus.
Oklahoma—A. R. Lewis, M. D., State Health Commissioner, Oklahoma City.
Rhode Island—B. U. Richards, M. D., Secretary, State Board of Health, Providence
Saskatchewan—M. M. Seymour, M. D., Commissioner of Health, Regina.
South Carolina—J. A. Hayne, M. D., State Health Officer, Columbia.
South Dakota—P. B. Jenkins, M. D., Superintendent, State Board of Health, Waubay
Tennessee—Olin West, M. D., Secretary, State Board of Health, Nashville.
Texas—C. W. Goddard, M. D., State Health Officer, Austin.
Utah—T. B. Beatty, M. D., State Health Commissioner, Salt Lake City.
Vermont—C. F. Dalton, M. D., Secretary, State Board of Health, Burlington.
Virginia—Ennion G. Williams, M. D., State Health Commissioner, Richmond.
Washington—J. B. Anderson, M. D., State Health Officer, Seattle.
West Virginia—S. L. Jepson, M. D., State Commissioner of Health, Charleston.
Wisconsin—C. A. Harper, M. D., State Health Officer, Madison.
Wyoming—C. Y. Beard, M. D., Sec'y, State Board of Health, Cheyenne.

REGIONAL SUPPLY OFFICERS

WESTERN STATES—Mr. Guy Jones, State Health Department, Sacramento, Cal.
SOUTHERN STATES—Miss Agnes Morris, State Health Department, New Orleans, La.
CENTRAL STATES—H. O. Jones, M. D., Department of Health, Chicago.

LIST OF NEW MEMBERS

PROPOSED FOR ELECTION TO THE

A. P. H. A.

FROM FEBRUARY 10, 1920, TO MARCH 12, 1920

SPONSORS* and NEW MEMBERS

C. W. Garrison, M. D., Little Rock, Ark.

G. K. Stephens, M. D., Newport, Ark.

James R. Scott, M. D., Los Angeles, Cal.

Garnet B. Grant, M. D., Asst. Prof. Univ. Southern Cal., Los Angeles, Cal.

W. H. Kellogg, M. D., Sacramento, Cal.

W. J. Hanna, M. D., Health Officer, Sacramento, Cal.

Burton Lowther, Denver, Colo.

George F. Gilkison, D. P. H., Chief Chemist, Water Department, Kansas City, Mo.

James A. Tobey, Washington, D. C.

Margaret F. Byington, American Red Cross, Washington, D. C.

James N. Rule, B. S., Director Junior Red Cross, Chevy Chase, D. C.

Jesse F. Steiner, Ph. D., Social Technologist, Washington, D. C.

E. E. Loubaugh, M. D., Boise, Idaho

Mrs. Catherine R. Athey, Exec. Sec. Idaho Anti-Tuberculosis Assn., Boise, Idaho.

Mr. L. B. Mangun, Kansas City, Kan.

Frank P. Strickland, Jr., City Chemist, Kansas City, Kan.

Thomas Tetreau, M. D., Portland, Me.

Clarence F. Kendall, M. D., Health Officer, Biddeford, Me.

A. W. Hedrich, Boston, Mass.

S. Boucher, M. D., City Department of Health, Montreal, Que.

Eugenio S. de Jesus, M. D., District Health Officer, Davao, P. I.

Alonzo B. Eckerdt, M. D., Pathologist, Warm Springs, Mont.

J. C. Geiger, M. D., U. S. Public Health Service, Washington, D. C.

Lawrence Griffith, City Engineer, Yonkers, N. Y.

Charles T. Haynes, Chief Sanitary Inspector, Auckland, New Zealand.

Ralph Hendricks, M. D., Health Officer, Spokane, Wash.

Vicente Kierulf, District Health Officer, Cotabato, P. I.

W. G. Long, M. D., Lake Providence, La.

J. D. Maguire, M. D., Health Officer, Lexington, Ky.

H. B. Roshon, V. M. D., Reading, Pa.

Wickliffe Rose, Ph. D., New York City.

Thomas W. Salmon, M. D., Medical Director, Nat'l Comm. Mental Hygiene, New York City.

R. R. Sayres, Chief Surgeon, U. S. Bureau of Mines, Washington, D. C.

Frank S. Shaw, State House, Des Moines, Iowa.

J. F. Siler, M. D., Col. Med. Corps, U. S. A., Washington, D. C.

Alan C. Sutton, M. D., Med. Corps, U. S. A., Washington, D. C.

Carl H. Verner, M. D., Director, Darlington Co. Health Dept., Darlington, S. C.

John Ritchie, Jr., Boston, Mass.

Bernard W. Carey, M. D., Dir. Div. Communicable Diseases, State Dept. of Health, Boston, Mass.

B. R. Rickards, Albany, N. Y.

Charles S. Prest, M. D., Director Health Service, American Red Cross, New York City.

Victor Heiser, M. D., New York City

J. S. C. Elkington, M. D., Chief Quarantine Officer, Brisbane, Queensland, Australia.

Frederick D. Hopkins, New York City

Murray A. Auerbach, Regional Secretary, Nat. Tub. Assn., Atlanta, Ga.

Henry W. Lehmkuhl, Rochester, N. Y.

R. T. Will, The Will Corporation, Rochester, N. Y.

Prof. Warren C. Taylor, Schenectady, N. Y.

Arnold H. Goodman, B. E., Chemist, Schenectady, N. Y.

Frederick W. Sears, M. D., Syracuse, N. Y.

Henry A. MacGruer, M. D., Commissioner of Health, Syracuse, N. Y.

George H. Shaw, M. D., Camillus, N. Y.

H. B. Larner, Goldsboro, N. C.

A. W. Fuchs, Sanitary Engineer, U. S. P. H. S., Goldsboro, N. C.

Chas. E. Low, M. D., Wilmington, N. C.

R. P. Huffman, D. V. M., Food and Dairy Inspector, Wilmington, N. C.

Mr. I. W. Mendelsohn, Grand Forks, N. D.

Samuel Claman, M. S., Health and Sanitation Officer, Grand Forks, N. D.

Harold J. Knapp, M. D., Cleveland, Ohio

W. D. Pack, Asst. City Chemist, Cleveland, Ohio.

Harold L. Lang, Pittsburgh, Pa.

Cecelia Murdoch, Technician, Sewickley, Pa.

Grace C. Taggart, B. A., Laboratory Technician, Pittsburgh, Pa.

C. W. Goddard, M. W., Austin, Tex.

M. E. Parker, M. D., Secretary State Board of Health, Austin, Tex.

K. B. Porter, Sec. Territorial Board of Health, Honolulu, Hawaii

Clifford Charlock, Chief Sanitary Inspector, Hilo, Hawaii.

*(States arranged in alphabetical order.)

NEWLY ELECTED OFFICERS

Roger I. Lee, M. D., of Harvard University, Cambridge, Mass., has been elected Treasurer of the Association to take the place of Guilford H. Sumner, M. D., of Des Moines, Iowa, resigned. Roger G. Perkins, M. D., of Western Reserve Medical School, Cleveland, Ohio, has been elected Vice-Chairman of the Laboratory Section in place of W. G. Bissell, M. D., deceased.

PUBLIC HEALTH NOTES

Abstracts by D. Greenberg, M. P. Horwood and Mayo Tolman.

Death Rate in 1918 Highest on Record.—The Federal Census Bureau has recently compiled the mortality statistics for the death registration area in the United States for 1918. The death registration area comprised 30 states, the District of Columbia and 27 registration cities in non-registration states. The total estimated population in this area is 81,868,104, or 77.8 per cent of the estimated population of the United States. The Territory of Hawaii is now a part of the registration area, but the figures given below relate only to the continental states.

The total number of deaths reported was 1,471,367, making a death rate of 18.0 per 1000 population, the highest rate on record in the Census Bureau. The high rate was due chiefly to the pandemic of influenza, which swept this country in 1918. There were 477,467 deaths from influenza and pneumonia (all forms) during 1918, or 32 per cent of the total deaths. Of this number 380,996 deaths occurred during the last four months of the year. The death rate for influenza and pneumonia (all forms) for 1918 was 583.2 per 100,000 population. Influenza caused 244,681 deaths and pneumonia (all forms), 232,786 deaths. In 1917 the death rate per 100,000 for influenza was 17.2 and for pneumonia (all forms) 149.8.

The next most important causes of death were organic diseases of the heart, tuberculosis (all forms), acute nephritis, Bright's disease and cancer. Together they were responsible for 391,391 deaths, or nearly 27 per cent of the total number. The death rate from organic diseases of the heart showed a slight decrease over 1917 when it was 152.2 per 100,000 population. In 1900 the death rate from this cause was 111.2 per 100,000 of population.

Tuberculosis (all forms) caused 122,040 deaths, of which 108,365 were due to tuberculosis of the lungs. The death rate for tuberculosis (all forms) was 149.1 per 100,000 population. The death rate for tuberculosis (all forms) has declined continuously since 1904, when it was 200.7 per 100,000 to 141.6 per 100,000 in 1916. The decrease has been nearly 30 per cent. Since 1916 the rate has increased slightly. Until 1912 tuberculosis was the chief cause of death. Since then the number of deaths from heart disease has surpassed that from tuberculosis.

Typhoid fever resulted in 10,210 deaths and had a death rate of 12.5 per 100,000 population. The death rate from this cause has shown a remarkable reduction since 1900 when it was 35.9 per 100,000. The decrease has been 65 per cent.

Cancer and other malignant tumors were responsible for 65,340 deaths, of which 24,783 or nearly 38 per cent, resulted from cancer of the stomach and liver. The death rate from this cause was 79.8 per 100,000. In 1917 the rate was 81.6 per 100,000 of population.

Diarrhea and enteritis caused 59,109 deaths, the death rate being 72.2 per 100,000 of population. The rate in 1917 was 79.0 per 100,000 population. More than four-fifths of the total deaths due to these two causes in 1918 occurred among children under 2 years of age.

Arterial diseases of various kinds, such as atheroma, aneurism, etc., caused 19,027 deaths, the death rate being 23.2 per 100,000 of population. In 1917 the death rate from the same cause was 25.3.

Whooping cough and measles together were responsible for 22,534 deaths, the death rate being 27.6 per 100,000 of population. The rate for whooping cough was 16.8 and for measles 10.8.

There were also 10,330 deaths, due to accidental falls, equivalent to a death rate of 12.6 per 100,000 of population; 9,937 deaths due to suicide; 8,610 deaths due to railroad accidents and injuries; 7,525 deaths due to auto accidents and injuries; 12,927 deaths due to diabetes; 12,783 deaths due to bronchitis; 11,280 deaths due to diphtheria, and 8,064 deaths due to meningitis.—*New York Times*, February 8, 1920.—(*M. P. H.*)

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New York City Has Lowest Infant Mortality Rate.—The New York City Health Department reports that during 1919 the infant mortality rate was only 82 per 1,000 births. This is the lowest rate in the history of the city. The infant mortality rate in 1918 was 91.7 and in 1917, 88.8. These low infant mortality rates doubtless indicate the efficiency of the child welfare campaign, which the city

has been conducting for many years. The results are the more remarkable for a community like New York, which has its share of poverty, of overcrowded conditions and of the uneducated, ignorant, foreign population. It is believed that one of the primary causes for the low infant death rate is the elevation of the standard of living among the poorer classes and the ability of these people to live up to the better standard.—*Weekly Bulletin*, New York City Health Department, January 31, 1920.—(*M. P. H.*)

✣

Botulism and Ripe Olives.—Several outbreaks of botulinus poisoning have recently occurred in Alliance, Ohio, Detroit, Mich., Kalispell, Mont., New York City and Memphis, Tenn. In most cases the fatalities were traced to the consumption of ripe olives. Some cases were also traced to home canned string beans, asparagus and corn. The ripe olives had come from California and had been packed in glass. On further investigation it was found that the jars had been heated for approximately one-half hour to the temperature of boiling water, a temperature which is insufficient to destroy the *Bacillus botulinus*, if the organism is present in ripe olives. The public is urged to refrain from using ripe olives packed in glass, and all other foods showing the slightest unnatural odor or color or sign of decomposition. Until this year *B. botulinus* was more commonly found in string beans and asparagus. It has also been found in sausage and cheese. The important thing to remember, however, is that it is never found in food which is not spoiled.—*Public Health Reports*, February 13, 1920.—(*M. P. H.*)

✣

Some Forward Steps in the Oklahoma Tuberculosis Campaign.—A recent pamphlet issued by the Oklahoma Tuberculosis Association contains numerous interesting papers delivered at the second annual meeting in September, 1919. Among these are "Occupations for the Tuberculous," by H. A. Pattison, M.D., "Indian Health Problems" by W. A. Van Cleave, M.D., "Health Conservation Among Indians," by L. W. White, M.D., "Public Health Nursing Needs in Oklahoma," by Miss Edith Swaine and the annual report of the General Society, Jules Scheritz. Mr. Scheritz tells of the sanatorium campaign which led to state provision for the establishment of two sanatoria for white people and one for negroes, and which established a bureau of tuberculosis in the State Health Department. Extensive publicity in combating tuberculosis has been conducted through exhibits, lantern slides in moving picture theaters, the daily press, display advertisements, day camps, special literature, special talks and public health nurses. Eight of the larger cities and counties in the state have already been organized to combat tuberculosis and are employing from one to three public health nurses each. Tuberculosis dispensaries are maintained in at least three cities in the state. Public health surveys were conducted in eight of the larger cities.

The Modern Health Crusade movement has been fostered and over 200,000 children enrolled. A monthly publication known as the Oklahoma Pow-Wow, is sent to all those interested in health work throughout the state. An intensive child welfare campaign, with examinations and demonstrations, was conducted in three counties during the summer of 1919. The association has also recently appointed a medical field secretary, an industrial field secretary, a public health nurse to work among the Indians, and a negro field secretary. In this way it is hoped that the anti-tuberculosis campaign will be pushed with greater vigor and along scientific lines.—(*M. P. H.*)

✣

Typhus in Esthonia.—Steps to combat the serious outbreak of typhus in Esthonia have recently been taken by the American Red Cross representatives in Europe. Early this year a dangerous shortage of doctors and nurses and an almost complete demoralization of hospital service was reported in face of a rapid spread of the epidemic. Lieut.-Col. Ryan, American Red Cross Commissioner for the Baltic States, has in addition to relief measures taken on the ground, arranged with the French Service de Santé for a detail of twenty French doctors for two months to assist in fighting the disease. In the vicinity of Narva the Red Cross is already caring for 15,000 typhus, dysentery and influenza patients.

Sixty-two American Red Cross nurses are now on duty in Serbia and Albania to battle against a recurrence of the typhus epidemic, which swept across the Balkans last year.

Exchange Professor of Public Health.—As has been announced, Professor William T. Sedgwick is to spend the summer in England as the first exchange professor in biology and public health that has entered into coöperative work of this kind. Soon after the visit of the British Educational Mission to this country in December, 1918, the late Dr. Richard C. Maclaurin, president of the Massachusetts Institute of Technology, suggested to the vice-chancellors of the Universities of Cambridge and Leeds that better educational understanding and international good fellowship might be promoted by the creation of a system of exchange professorships between the institute and the universities. In the development of this plan Dr. Maclaurin named Dr. Sedgwick to be the first professor sent out by the institute. Dr. Sedgwick is senior professor at the Institute and head of the department of biology and public health. He will divide his time between the universities named, returning to this country in September. It is not probable that the return professor will be sent from England before next year.

✝

Experimental Influenza.—Blake & Cecil describe results obtained during an investigation of experimental pneumonia in monkeys by intratracheal injection of *B. influenzæ* undertaken with the hope of throwing light on its relation to the influenza epidemic. The strain of *B. influenzæ* employed was originally isolated from a case of influenzal pneumonia in a child and its virulence was enhanced by passage through animals. Twelve monkeys received inoculation of *B. influenzæ* in the nose or nose and mouth, every one of which developed within from three to six hours a respiratory disease apparently identical with influenza. Five of them developed an acute purulent sinusitis of the antrum of Highmore, from which *B. influenzæ* in pure or mixed culture was taken. Nine animals were killed and in the great majority the influenza organism was found either in pure culture or mixed with other germs. Of ten monkeys injected intratracheally with the same strain, seven developed pneumonia, showing the same pathologic picture as in man. The author's conclusions are: "1. *Bacillus influenzæ* can initiate in monkeys an acute infection of the upper respiratory tract which may be complicated by acute sinusitis, tracheo-bronchitis and bronchopneumonia. 2. This disease appears to be identical with influenza in man. 3. *B. influenzæ* when injected intratracheally will produce in monkeys a tracheobronchitis and bronchopneumonia, the pathology of which appears to be essentially identical with that which has been ascribed to pure influenza bacillus infection of the lungs in man. 4. In view of these facts and the constant association of *B. influenzæ* with early uncomplicated cases of influenza, it seems reasonable to infer that *B. influenzæ* is the specific cause of influenza. —F. G. Blake and R. L. Cecil, *Jour. A. M. A.*, Jan. 17, 1920, 170.—(*D. G.*)

✝

Free Diagnostic Clinic at Buffalo, N. Y.—The Board of Managers of Hospitals and Dispensaries of the city of Buffalo announce the opening of a clinic for diagnosis only to which physicians may refer their patients. Patients will receive preliminary examination, proper histories will be executed and necessary laboratory specimens taken. Any child or adult resident of Buffalo or of Erie county is eligible for examination. These clinics are set for Mondays throughout the year at one of the health centers of the city, and on the following Wednesdays applicants may make a return visit to the Buffalo City Hospital, at which time and place patients furnished with the preliminary data will be presented to specialists representing some 17 divisions. The reports of the findings will be mailed to the physician. No treatments will be given, nor will patients be examined save on written recommendation of a regularly licensed doctor of medicine. The clinic is intended for the use of patients' pay patients, to whom the cost of a consultation would be a burden, but no investigation of the financial standing of any applicant will be attempted. Physicians are warned that if they refer cases obviously able to pay a consultation fee to the clinic or exact from patients thus referred a fee larger than is customary for ordinary visits, such act will be construed as abuse of privilege and will result in barring the physician from the clinic. The organization and maintenance of this clinic are loyally administered by departments of the University of Buffalo as a benefit to the community.

Congress of the American School Hygiene Association.—One of the most interesting and popular meetings, held in Cleveland, O., on Friday, February 25-27, in connection with the annual convention of the Department of Superintendent of the National Education Association, was that of the American School Hygiene Association. There were nine sessions with fully 3,000 people, representing nearly every section of the United States, and many from Canada, in attendance.

The entire first day, Wednesday, was devoted to the consideration of health education as conducted in the United states, in Canada, in cities, in rural communities, in universities, in normal schools and in other special fields.

School health service commanded the attention of large audiences during all of the second day of the Congress. Medical inspection in schools, physical education, speech improvement, conservation of vision, the simplification and standardization of health records for school children, and the correlation of medical inspection and physical training, were some of the timely subjects presented before these sessions.

The Thursday morning session had sex education for its subject. Speakers of national prominence presented the following subjects for consideration: An Emergency Solution for an Emergency Need; Suggested Plan for Systematic Sex Education; Seeing Boyhood Through; and Sex Education in Home and in School.

On Thursday afternoon a symposium was given on "Relation of School and Health Authorities with Respect to School Health Service." This was participated in by representatives of health and educational departments and by others.

Mental Hygiene was discussed on Thursday evening. An audience of 450 people was in attendance at this session.

The session on mouth hygiene on Friday morning presented many practical and valuable contributions toward modern methods of dealing with dental conditions among school children. The speakers represented the Federal Government, the National Dental Association, the Rochester Dental Dispensary, the American Red Cross, colleges and magazines.

The closing session on Friday afternoon was devoted to nutrition of school children. This session was opened by a clinic with school children illustrating a practical plan for dealing with nutrition among children. A valuable contribution was made by one of the speakers who presented a State program for nutrition of school children, while another speaker gave many practical suggestions on interesting school children in health habits. Equally interesting were the papers in this session on school lunches in cities, in villages and in rural communities.

The proceedings of the Congress containing the papers will be published as soon as possible and can be obtained from the Secretary of the Association, Harry B. Burns, M.D., Director of School Hygiene, Pittsburgh, Pa. William A. Howe, M.D., of Albany, N. Y., State Medical Inspector of Schools, was elected President and Hiram Byrd, M.D., of the University of Mississippi, Vice-president.

✣

Eighty-three Health Agencies in New York County.—There are fully 83 kinds of health in New York County. This is the first finding of the preliminary activities of the new Department of Health Service, New York County Chapter, American Red Cross. And, though this tentative list includes 53 local and 30 state and national organizations, most of them have headquarters in the city itself.

Such a list the Red Cross believes has never been compiled before and has been made now by the Health Service as a beginning on the Chapter's reconstruction program to meet after-war issues and to start peace-time work. It is the first step of this newest Red Cross department to strengthen and supplement the work of existing public health agencies.

It is a preliminary list of organizations engaged in preventive and educational health work, ranging all the way from associations to prevent and control tuberculosis, cancer, and venereal disease to welfare societies for mothers and babies, nursing associations, relief societies that have definite public health activities, clubs that have active public health committees and settlements that maintain public health work.

The first draft of the list has been sent to all these 83 health agencies for their suggestions and when in final form will be available to everybody, through the Information Bureau of the Department of Health Service, American Red Cross, which expects to begin to turn its information over to the public early in the spring.

Health Centers.—The American Red Cross, in passing from a war to a peace time basis of activity, has taken as one of its goals the unification of community health activities so that there may be greater cooperation among existing health agencies and less duplication of effort. To this end it is fostering the establishment of health centers in all communities. The health center should be the point from which all the health activities of the community radiate. It should be the headquarters of the health officer and his staff, of the tuberculosis clinic, the child and infant welfare clinic, the venereal disease clinic, the mental hygiene clinic and the clinic where cases of industrial disease are examined. In addition, it should be the location of the dental clinic, the clinic dealing with eye, ear, nose and throat defects. The local hospital should attempt to establish much of its out-patient work at the health center. In addition to some of the clinics already mentioned the hospital might locate at the health center, the general medical and surgical clinic, the orthopedic clinic, the obstetrical clinic, the gynecological clinic and the dermatological clinic. The health center could also be the headquarters for after care work growing out of epidemics of influenza and poliomyelitis. The health center should also be the source of all the health educational activities of the health agencies aiming to instruct the people in hygiene, sanitation and the prevention of disease. Here the propaganda for frequent periodic medical examinations could be carried on. Here, too, the medical profession should be provided with meeting rooms and a consultation service. There should also be adequate and excellent facilities for holding public meetings for the purpose of instructing the people in the principles of healthful living. The health center would provide a place for the early diagnosis of disease. Here, too, the forces necessary to combat epidemics or other public emergencies would be mobilized and kept ready for action. Finally, the health center should be the home of the best library in the city, in books and pamphlets and circulars dealing with matters pertaining to the public health.—(*M. P. H.*)

✚

Panama Canal Health Service Work.—The quarantine officials of the Canal Zone are employing two novel methods whereby to effect their inspection of vessels and at the same time subject the vessels to the minimum of delay.

1. The trapping of vessels from ports within the yellow fever zone on their arrival at the Canal. This is done regardless of whether the vessels have been fumigated or not at the port of departure. Trapping is done by two attendants who go over all accessible parts of the ship with a spotlight and killing tube. In the long fight against malaria on the Isthmus this method of catching mosquitoes has been developed to the point where the trapper gets practically all of the mosquitoes in a given place if allowed sufficient time. As adapted to vessels it requires two experienced men about two hours per ship. Mosquito trapping is a check upon the efficiency of the previous fumigation, and in addition shows if the vessel has been where mosquitoes could get on board and the exact kind of mosquitoes. It is believed that this work, which already has a direct bearing on the treatment of the individual vessel, will furnish knowledge that may allow modifications in the general yellow fever quarantine.

2. The use of army gas mask in fumigation. When a vessel is opened up after fumigation, whether this be done with sulphur dioxide or hydrocyanic acid gas, there has been a delay waiting for the gas to be removed sufficiently so that the attendants could enter the apartments and open up completely. With the use of the gas mask the attendants enter immediately without any danger, and after opening all ports, doors, etc., proceed to gather up their apparatus without further delay.

✚

School for Nurses in Bohemia.—Prague is to have the first training school for nurses in Czecho-Slovakia. Realizing that the shortage of native doctors and nurses caused by the war was a very serious problem and that the best way of solving it was to train native personnel, the new government, through Dr. Alice Masaryk, daughter of the president of the republic, appealed to the American Red Cross for assistance. A plan has been worked out for which the Red Cross appropriated $20,000, and is already in operation. Two American Red Cross nurses, Miss Marian Parsons, former chief nurse of General Hospital No. 22, British Expeditionary Forces, and Miss Alotta Lentell, who served with the Red Cross in Flanders, have recently arrived in Prague to establish the school. Miss Par-

sons will be the superintendent and Miss Lentell will be her assistant.

During the three years that these American nurses remain in Czecho-Slovakia two young Czecho-Slovakian women will be sent to the United States to enter an American training school and prepare themselves to return to their own country and carry on the work initiated by the American nurses. The Massachusetts General Hospital, Boston, has agreed to accept these pupils as soon as they arrive in this country.

✣

How the Other Half is Born.—Under this striking caption the Children's Bureau of the U. S. Department of Labor presents the facts deduced from a set of studies in six rural areas in four states.

In a northwestern county and in a southeastern county there were nearly twice as many persons per physician as the average for the United States; in a southern mountain county there were four times as many. A vast area in the far northwest, larger than the state of Connecticut, was served by three registered doctors. Moreover, most of the doctors in every rural county were located at the county seat, while the remoter parts of the county were entirely without medical service.

More than one-third of the families in the far northwestern county studied were 20 miles or more from the nearest doctor, 10 being from 50 to 100 miles away. In a southern county more than one-fourth of the families were 10 miles or more from a doctor, and in another county 25 miles was not an uncommon distance.

Such distances cause delay on the part of physicians, who arrive too late to be of best service to their patients, and, discouraged by repeated experiences, the people of small communities are tempted to do without one altogether, and frequently do not take the initial steps till the patient's condition becomes critical.

In a southern county only 68 out of 160 mothers had a doctor at their last confinement; in only 8 out of 66 confinement cases in a northern county was a physician secured, and in still another more than two-thirds of the women did not have a physician when their babies were born. Three were entirely alone and 46 had only their husbands in attendance.

Women would in many cases leave home for confinement if hospitals were within reach. But one 5,500-mile area had no hospital; neither had the southern mountain county. Reaching a hospital meant a journey of several days by wagon trail or one by stage across the roughest of mountain roads.

In a large number of cases the mother has no nursing care except that given by an untrained hired girl, a relative or a neighbor. Figures gathered from five rural counties are small in number but appalling in significance: 45 out of 89 babies, 22 out of 28, 12 out of 15, 10 out of 16, 10 out of 14 babies died *before they were a month old.*

✣

Red Cross in American Hospitals.—Red Cross Home Service workers are looking after disabled men in thirty-nine of the forty-three Public Health Hospitals of the country. During December the total number of men received was 10,487 and 8,270 had out-patient care. Problems varying from compensation claims to straightening out love affairs were taken by these men to Red Cross workers.

✣

Eye Strain and the Movies.—If your eyes trouble at the movies, do not blame it on the pictures, but consult your doctor about your eyes. This is the advice given by the U. S. Public Health Service.

The fact that millions of people go to motion picture shows throughout the United States daily without experiencing any discomfort to their eyes, or that such eye trouble that is found is not traceable to "over-indulgence" in the movies, would seem to indicate that motion pictures are not injurious to the vision.

In this connection it may be pointed out that employes of motion picture playhouses who spend a large part of the day looking at the pictures, do not seem to be troubled with their eyes any more than the average individual.

It is safe to say a person may witness a picture play lasting about an hour and a half each day without straining the eyes or experiencing any discomfort, provided the eyes are good and there are no hidden defects to the vision. Indeed it is not unlikely that a motion picture show might be the means of advising one of a faulty vision.

A Record Health Year Was 1919.—According to the *Statistical Bulletin* of the Metropolitan Life Insurance Company, the year 1919, despite its very unpromising beginning, closed with better health conditions than have prevailed during any year on record. Between January and March, the United States and Canada were still feeling the effects of the wave of influenza. Many cities were having their worst attacks in those months. The outlook generally was gloomy. Based upon what happened after the epidemic of 1889, health officers expected a return of the influenza during the course of the year and a high death rate from diseases of the heart and kidneys. The country was full of persons who had been left weakened as the result of the influenza, and many of these were expected to die and thus increase the death rate. But the expected did not happen; beginning with the month of April and continuing for each month thereafter up to the end of the year, mortality rates fell sharply below the average of the preceding years. The death rate of the summer of 1919 was unusually low, and the extraordinarily favorable record continued throughout the autumn. In fact, the death rates for the last quarter of the year instead of showing the marked increases usual for the early winter, were as low as some of the best summer and autumn rates on record. From the health standpoint, the year 1919 has been one full of agreeable surprises.

These conditions prevailed in the general population and also among the twelve million policy-holders of the Metropolitan Life Insurance Company. An investigation of the records for policyholders of this company shows an unusually low prevalence of such diseases as tuberculosis, typhoid fever, measles, whooping cough, diseases of the heart and kidneys, diarrheal complaints and of accidents. During the last quarter of the year, there has been an increase in the death rates from scarlet fever and from diphtheria; but these were not of sufficient importance to influence the total death rates. A very remarkable feature of the insurance experience has been the marked improvement in the mortality among negroes.

✣

Influenza Among the Tuberculous.—After a careful analysis of the cases of tuberculosis registered at the Baltimore Health Department the author has written an interesting preliminary note on the incidence of epidemic influenza among the actively tuberculous. Of the 2,375 tuberculous persons, 595, or 25 per cent had influenza, while 1,780 or 75 per cent did not have this disease during the epidemic. Of the 8,820 non-tuberculous individuals living in the same households as the tuberculous, 1,971, or 22.3 per cent had influenza and 6,849, or 77.7 per cent did not have it.

Another table shows: 1. That a little more than one-half (1,104) of the total number of households (2,060) comprised in the statistics had no case of influenza in them during the epidemic. 2. That only about one-fourth (2,572) of the total persons (11,055) included in the statistics had influenza. 3. That in households where only one case of influenza occurred, 37 per cent of the tuberculous persons living in such households had influenza, while but 15 per cent of the non-tuberculous living in such households had influenza. 4. That in households where two cases of influenza occurred, 48 per cent of the tuberculous persons, and 34 per cent of the non-tuberculous living in such households had influenza. 5. That in households where three or more cases of influenza occurred, 68 per cent of the tuberculous persons and 66 per cent of the non-tuberculous living in such households contracted influenza.—Raymond Pearl, *Quart. Pub. of the Amer. Stat. Assoc.*, Dec., 1919, 536. (D. G.)

✣

Destroying Lice in Clothing.—The observations reported by Hutchison show that if the penetration of steam is sufficient to produce a temperature of 75°C. (167°F.) in the center of a barracks bag (or other load of infected goods) all eggs and active stages of body lice will be destroyed. If the disinfectors are operated efficiently on the time schedule now employed (viz., a 10-inch preliminary vacuum; 15 pounds steam pressure for 15 minutes, reckoned from the time the steam is turned on; followed by a 10-inch drying vacuum), the requisite temperature (75°C.) is attained in every case. By efficient operation is meant (1) the maintenance of a full head of steam so that the 15 pounds pressure in the disinfector is produced within 5 minutes, thus allowing at least 10 minutes for exposure; (2) overloading must be guarded against; (3) the individual bundles must not be rolled too tightly. Little, if any, shrinkage of woolen goods is caused by this treatment. —R. H. Hutchinson, *Jour. Paras.* Dec., 1919, 65.—(*D. G.*)

STATE HEALTH NOTES—LEGISLATION

National—Health officers will be interested in the scope of the Federal Food and Drugs Act, which contains definitions of "food" and "drug" which differ somewhat from the popular understanding of these terms.

The term "food" includes "all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound."

The term "drug" includes "all medicines and preparations recognized in the United States Pharmacopoeia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either man or other animals."

✚

All articles included within these definitions are subject to the provisions of the Federal Food and Drugs Act which (1) are shipped or delivered for shipment from any State or Territory or the District of Columbia into any other State of Territory or the District of Columbia; (2) are shipped or delivered for shipment from any State or Territory or the District of Columbia to any foreign country; (3) are being imported into the United States; or (4) are manufactured, sold, or offered for sale in the District of Columbia or any Territory of the United States.

✚

The provisions of the Federal Food and Drugs Act do not apply to articles which are manufactured and produced in one State and are not thereafter shipped outside of that State. Any person selling or delivering any food or drug to any person in the same State may, however, incur the penalties prescribed by the Act if, in accordance with section 9, he guarantees that the article is not adulterated or misbranded within the Act and the article thereafter enters interstate or foreign commerce.

Requests for information as to the scope of State food and drug laws should be addressed to State officials.

✚

Indiana.—Although the legislature does not meet till January, 1921, the Indiana State Board of Health has prepared two bills to be presented early in the session. One of these is to establish full-time health officers and the other, to make compulsory school health supervision of children. It is believed that public opinion will support these bills and that they will be passed and with them good appropriations and wide powers for the State Board.

✚

Kentucky.—In the September Bulletin of the State Board of Health are presented the "Food and Drug Laws Rules and Regulations" as amended in 1918. These include sections referring to misbranding, inspection, bacteriological examination, sanitation of food establishments, offenses against the public health, dairies and dairy cattle, bakers and bakeries, handling of eggs, abattoirs and retail meat establishments.

✚

Massachusetts.—It is expected that the Committees on Public Health and of Education of the Massachusetts legislature will report a bill for the establishment of a State Director of Physical Training in Public Schools. An informal counting of noses shows the majority to be in favor of reporting. Child health legislation will be important during the session. There are two bills proposed, one for the establishment of minimum rules and regulations for the teaching of hygiene in the public schools and for the physical training of school children, the bill carrying appropriations for the purpose. The other makes it imperative on the authorities in cities and towns to instal school nurses.

✚

The *Boston Medical and Surgical Journal* in a report of a joint committee of the Massachusetts Medical Society and the Massachusetts Homeopathic Medical Society, notes the status of three bills before the legislature on maternity benefits. These bills, which vary in details, are aimed at the advising and assisting of pregnant women who have been for one year at least residents in the state. The Spencer bill provides two months' notice by the woman, that any money benefit, not to exceed $12 a week, shall be paid directly to the mother, and that no stigma of pauperism shall follow the payment of

such benefit sums. The Carey bill mentions no period in advance of confinement for the application, but in other respects is similar to the other bill. The Young bill makes the date of application three months before the expected date of confinement. Here the State is to pay the physician. There are various minor differences, the Young bill omits reference to illegitimacy, the Spencer bill puts the burden on the State Board of Health of determining the financial condition of applicants, but provides no control over the physician provided he accepts the stipulated fee. The Young bill provides that he must not only accept the fee but abide by the rules issued by the State Board of Health. "In this clause," notes the *Boston Medical and Surgical Journal*, "lies the opportunity to bring about better conditions of obstetrical practice."

✣

New Mexico.—The special meeting of the State Legislature held February 16-21, 1920, passed Senate Bill No. 5, "An Act authorizing employment of health employes and the levying of special taxes for certain health purposes." The act passed the Senate 17 to 5, and the House of Representatives 34 to 0, and was approved by Governor O. A. Larrazolo, February 21.

This act will make possible the employment of full-time county and municipal health officers with a sufficient staff of sanitary inspectors, public health nurses, etc., in local health departments, and provides for the levying of a special tax not to exceed one-half mill on a dollar of assessed valuation of property within the county or municipality, to provide for the salary and expenses of local health departments.

In 1919 the regular session enacted a very complete and progressive health law providing for the creation of a State Department of Health and made appropriations for its maintenance. The State Department has adopted regulations requiring the reporting of births, deaths and morbidity. These regulations follow the model law. In order to carry out the provisions of the law it was found that full-time health officers would be necessary and funds. The special levy for this purpose is supposed to be the first one of its kind in the country, namely, a levy in excess of the regular maximum which is to be devoted to health work.

In the passage of the Act the New Mexico Public Health Association was very active.

✣

North Dakota.—The State Board of Health has issued its regulations governing water supplies in the state, and sewerage and refuse disposal. The water supply that is furnished to more than 25 persons shall be subject ot bacteriological examinations and must satisfy the standards of the U. S. Public Health Service as set forth for interstate common carrier supplies. Sewage disposal by flowing it into streams is regulated, sewage being interpreted to be industrial wastes as well as those from humans and animals. Garbage regulations control retention in houses, disposal in various ways, and forbids filling land by dumping, excepting with the approval of the health officer. Special note is made of garbage retainers, which must be water tight, covered, fly and rat proof, set at least 9 inches above ground, and they must be emptied at least once every 48 hours.

Plans for water supply systems or sewage disposal must be approved by the State Board of Health in their sanitary features, elaborate regulations control the details of the drawings to be submitted, and plans must look well into the future. "The sewers should have a capacity when flowing half-full, sufficient to carry twice the future average flow 25 years hence, plus a sufficient allowance for ground water infiltration."

The regulations interfere little with sewage systems existing January 1, 1920, in municipalities, but require that when any city or village builds a municipal sewer, all abuttors to the sewer line where the property has been platted into lots, shall, under penalty, install toilets, connected with the water supply and sewer.

STATE HEALTH NOTES—GENERAL

Connecticut.—The leaflet published by the Bureau of Preventable Diseases of the Connecticut State Department of Health urges the use of the Schick test for determining immunity to diphtheria to be followed by the toxin-antitoxin treatment, pointing out that only 30 per cent of children between one and two years of age are naturally immune, though

this percentage increases until nearly 85 per cent are immune at 20 years of age.

The use of the toxin-antitoxin treatment following the Schick test, apparently insures 100 per cent immunity, and it is pointed out that had this treatment been used in 1918, many of the 201 deaths among Connecticut children from diphtheria could have been prevented.—(*M. T.*)

✚

Indiana.—The State of Indiana has purchased two automobiles especially for the fight against tuberculosis. It is proposed to conduct an intensive campaign in a few of the counties that are entirely rural. The principle of the work will be to get at the children, for the reason that probably 80 per cent of all consumption is acquired in childhood. The lectures, literature and exhibits will be focused on this point. The remedy proposed is education in right living. The director of this work is Dr. H. W. McKane.

The State Health Department has another auto for the Division of Child Hygiene, which will likewise be devoted to touring the rural sections. Its slogan is, "Save the child and you will save the man." The outfit includes an exhibition, posters and literature and in its personnel are two nurses. The company will stay in any county long enough to visit every township and see that every home receives instructions with reference to tuberculosis and child hygiene. The schoolhouses will be centers for much of this work.

✚

Maine.—More than 600,000 visitors came to Maine during the summer of 1919, spending in this state from $27,000,000 to $30,000,000, according to figures included in the report of A. S. Dean of Portland, hotel inspector for the past season. Inspection of hotels during the summer season when vacation resorts as well as year round commercial houses are open to guests, is conducted annually under the supervision of the State Department of Health to determine whether or not such places are sanitary; use unpolluted water and pure milk, and otherwise keep the health regulations.

In the 253 hotels visited by the inspector, the majority of them along the coast with a few commercial establishments in Bangor, Portland and several smaller towns, sanitary conditions were noted as excellent in but 22. Twenty-three hotels were listed as "very good," 146 as "good," 45 as "fair," and 17 as frankly "poor."

More than $36,000 was saved to the people of Maine during 1919 through the 10,000 free tests which were made by the diagnostic laboratory of the State Department of Health for such diseases as diphtheria, typhoid, tuberculosis, cancer, syphilis, gonorrhea, and other germ diseases. The record for the year shows an average of 27 examinations daily at an average commercial value of $3.68 each or a daily total of $9,715. The tests made include 1,063 for diphtheria, 1,827 of sputum for tuberculosis, 243 for malignancy, 380 for typhoid, and 5,837 for venereal disease. These figures show an almost 50 per cent increase over the preceding year and are interpreted by the commissioner, Dr. L. D. Bristol as highly indicative of the value which Maine people are putting upon the services of the department.

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Minnesota.—The general death rate for Minnesota is declining. The table below giving the total number of deaths year by year since 1910, also the rate, that is, the number per 1,000 population. In order to compare the number of deaths from year to year, it is to be remembered that the population is increasing.

1918 was an exceptional year, and the influenza epidemic gave the state the highest death rate it has had.

In 1919 there were 2,500 influenza deaths, about 25 times the usual number, but in spite of this, the improvement in other causes brought the rate down to 10.4, which is about normal.

MINNESOTA'S DEATH RATE FOR THE PAST DECADE
Deaths from all causes per 1,000 of population

Year	No. of Deaths	Rate
1910	22,868	11.05
1911	21,893	10.35
1912	20,502	9.57
1913	22,799	10.45
1914	23,382	10.6
1915	22,755	10.15
1916	24,295	10.81
1917	23,955	10.4
1918	31,342	13.3
1919	24,794	10.4

The "Keeping Fit" campaign instituted by the U. S. Public Health Service in its efforts to reach by placards, slides and literature all the boys of high school age in the country, is being vigorously carried on. The Minnesota State Board of Health, however, is the first to

present an exhibit of like character to the girls. Dr. Mabel S. Ulrich has prepared for this purpose several sets of placards, 41 in each set, 31 of which are appropriately illustrated in color. The exhibit is primarily an educational health appeal, no particular stress being laid on either disease or sex—the title of the exhibit being "Better Womanhood."

The State Board of Health of Minnesota has issued the following instructions to the physicians of the state with reference to venereal diseases. The Division of Venereal Diseases was organized during the war when many of the physicians were in service. Since these men have had no opportunity to become acquainted with the Minnesota practices, a special letter is addressed to them.

The physician is interested primarily in the diagnosis and treatment of his patient, the State Board of Health is interested primarily in protection of the public health and in the individual patient only as it may protect the public through the diagnosis and treatment of that patient. These two angles are not incompatible, and it is hoped physicians will become more and more interested in the latter one.

The important items in regard to reporting cases are: Reports of infectious and contagious diseases are necessary for two vital reasons—1st, we must know our problem, in other words, how many cases there are. 2nd, we must know the location of these cases in order that control measures be taken if necessary.

It follows then that every case of gonorrhea, syphilis and chancroid must be reported.

It makes no difference whether infective or not.

It makes no difference whether previously reported or not.

It makes no difference if our laboratory has a positive finding on its records.

Report every case you diagnose or treat.

If you see them only once and they fail to return, report name and address to this division, and an investigation will be made.

If a patient has been previously reported, report him again so we will know where to locate him.

If you see a case and expect to refer it to someone else, report it—patients do not always go where sent, and we are in a position to find out and take action.

A positive laboratory report does not constitute a report of a case. All cases must be reported on a card supplied for the purpose.

New Mexico.—Dr. C. E. Waller of the department of public health, together with the forest officials, have worked out a plan whereby every forest ranger in the state will be made a representative of the department of health.

The forestry officers will advise the people of the law and assist them in familiarizing themselves with it, report to the state officers any violations. This will apply in the small remote settlements where, under present conditions it is very difficult for the state officer to enforce or even teach sanitation and health regulations.

Such an arrangement has been in effect in Arizona for some time and the results attained are very gratifying.

Walter M. Connell, chairman of Albuquerque City Commissioners has been appointed vice-president of the New Mexico Public Health Association to fill the vacancy made by the death of Dr. Oliver T. Hyde.

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Seventy persons attended the annual meeting of the New Mexico Public Health Association held in Alburquerque, January 27th.

At the business meeting, H. O. Bursum of Socorro was elected president, Dr. O. T. Hyde of Albuquerque first vice-president, Col. Bronson M. Cutting of Santa Fé second vice-president, M. W. Murray of Silver City third vice-president, Dr. Frank N. Carrier of Santa Rita secretary, and Dr. David R. Boyd of Albuquerque treasurer.

The following new directors were chosen to take the place of those whose terms had expired: Bernalillo, J. T. McLaughlin and Dr. J. E. J. Harris, Albuquerque; Chaves, Clark Dilley, Roswell; Colfax, Ernest D. Raynolds, Raton; Curry, E. W. Bowyer, Clovis; Dona Ana, W. A. Sutherland, Las Cruces; Grant, W. O. Hall, Silver City; Guadalupe, Frank Faircloth, Santa Rosa; Luna, E. D. Martin, Deming; McKinley, Mrs. C. C. Manning, Gallup; Otero, R. R. Pratt, Alamogordo; Rio Arriba, H. L. Hall, Chama; San Juan, Sherman R. Coon, Aztec; Santa Fe, Dr. Robert O. Brown, Santa Fe; Union, T. E. Mitchell, Albert.

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New York.—The Bureau of Venereal Diseases of the New York State Department of Health offers a prize of $100 to the person who best interprets the expression "Healthy parents head happy families," in a colored

drawing that can be reproduced as a poster for public health work.

Drawings may be made any size, but must not be smaller than 12 by 18 inches.

Drawings may be signed by artist. Signatures will be covered before seen by judges. Judges will be announced later by Dr. Hermann M. Biggs, commissioner of health.

Winner will be chosen from among those whose drawings are received at the New York state department of health, Albany, N. Y., before 5 p. m. May 1, 1920.

Drawings will be returned if artist will submit postage. It may be desirable to purchase for use elsewhere certain of those not winning the prize.

The bureau reserves the right to reject all drawings if in the minds of the judging committee none satisfactorily meets the requirements.

Posters in use by this bureau at present picture the horrors following in the wake of the venereal diseases and it is felt that for the sake of constructive work a poster depicting full robust health should be employed.

Dr. Joseph E. Clark, sanitary supervisor of the New York State Department of Health for Oneida, Herkimer and Madison counties, died at the Utica Hospital on March 4th after an illness of nearly a year.

For a number of years, Dr. Clark was chairman of the Board of Health of the City of Medford, Mass. In 1914, following the reorganization of the New York State Department of Health, he was appointed a State Sanitary Supervisor and continued in that capacity up to the time of his death.

The post-graduate course in infectious diseases and public health, given by the Albany Medical College in coöperation with the State Board of Health opened on March 4 with 51 registrations, a number of the men being of the school of last year, who wish to keep up with the times. The order of exercises at the opening of the course included an address by Dr. Charles C. Duryee, director of the course, followed by a lecture on general bacteriology and technique by Dr. Augustus B. Wadsworth, director of the division of laboratories and research of the state board. After luncheon Dr. Hermann M. Biggs, state health commissioner, addressed the men and there was a general conference on tuberculosis led by Dr. H. Edgar Rose of the state department of health. The students will meet one day each week until the middle of June. This can be done by them without neglecting their regular duties.

The commencement exercises of the Buffalo post-graduate course in preventive medicine and hygiene for health officers were held at the Lafayette Hotel on January 29th, 21 members of the 1919-20 class receiving diplomas. Dr. Charles S. Jones, dean of the medical department of the University of Buffalo, presided.

The Rotary Clubs of Syracuse recently gave a party to 82 children of that city who are crippled as a result of infantile paralysis. After the entertainment, refreshments were served and toys were distributed. Helena T. Mahoney, state supervising nurse, and Miss Abby Cornell, social worker of Syracuse, were in charge of the details.

Another list of towns in New York state which have inadequate medical service or where it is lacking altogether, has been published by the New York state health department, to which application should be made for further details. The towns and their respective counties are:

Town	County
Bloomville	Delaware
Cameron	Steuben
Cannonville	Delaware
Fremont	Sullivan
Gardiner	Ulster
Gilboa	Scoharie
Groveland	Livingston
Halcottville	Delaware
Lewis	Essex
Mariette	Onondaga
Meridale	Delaware
Medford	Suffolk
Newton Falls	St. Lawrence
North Bangor	Franklin
North Java	Wyoming
Piercefield	St. Lawrence
Putnam	Washington
Richfield Springs	Otsego
Rock Rift	Delaware
Rockwood	Fulton
Sidney Center	Delaware
Spafford	Onondaga
Starkville	Herkimer
Sterling	Cayuga
Treadwell	Delaware
Westford	Otsego
Willsboro	Essex
West Hebron	Washington.

The Red Cross and city health department

cooperating, have started a mental clinic in Plattsburgh. Dr. John R. Ross, medical superintendent of the Dannemora State Hospital, is the specialist in attendance.

A summary of the Oneida county tuberculosis clinics, which have been held under the auspices of the New York State Department of Health and the State Charities Aid Association, shows that 1,287 patients were examined, of these 214, or 16.6 per cent were found positive, 390 or 30 per cent suspicious, and 683 negative. The clinics were held at accessible clinic centers, extending over a period of six months.

Thirty-three nurses, having completed the four months' public health nursing course at the University of Buffalo, have received their certificates in public health nursing.

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North Carolina.—The Bureau of Venereal Diseases of North Carolina has instituted a "Keeping Fit" campaign among the boys and young men of the state under the care of Mr. Henry P. Coor, educational director, U. S. P. H. S. The campaign is expressly for older boys ranging in age from 14 to 20, and has been arranged with much consideration and thought. Quotas have been set for the different counties, the goal is 50,000 boys, and proceedings are well under way, Wilson county having already secured one-third of its quota and Guilford county one-fifth. Exhibits, lecture material, and instructions have been widely distributed.

At a conference of representative colored people of the State of North Carolina held in Raleigh, February 6, 1920, under the auspices of the North Carolina State Board of Health and the United States Public Health Service, the following resolutions were unanimously adopted:

WHEREAS, This conference recognizes the fact that the venereal diseases constitute a serious problem demanding careful thought and attention; and,

WHEREAS, The control of venereal diseases requres the coöperation of all persons and agencies in each community; and,

WHEREAS, Proper provision for the expression through natural outlets of the play and adventure instincts of life is necessary for the security of health and morals, and,

WHEREAS, An essential factor in preventing the venereal diseases is social betterment through the removal of negative, predisposing conditions and the development of positive, corrective agencies; and,

WHEREAS, It is the conviction of this conference that all institutions having to do with the developing of leaders in human society should give to their students adequate knowledge of the meaning of sex as a factor in life and should acquaint them with the best psychology that would assist them in bringing this knowledge to the attention and aid of those whom they serve; therefore, be it

Resolved, That the following recommendations be made:

1. That all medical men and women, including physicians, pharmacists, dentists and nurses in their private practices and in the institutions, organizations and businesses with which they are identified do regularly and efficiently render their best service in the treatment and control of venereal diseases.

2. That all directors and members of public welfare departments, supervisors and attendants of places of amusement and recreation, probation officers, social workers, and others engaged in activities for community welfare do render every possible service for the removal of the negative, underlying and predisposing conditions for social ills and for the development of wholesome community life.

3. That citizens in communities which have no social welfare work be encouraged to employ social workers and establish social centers and to request the local authorities to aid in the establishment and maintenance of such persons and institutions.

4. That the church and fraternal organizations, because of their large and interested membership, and the press, because of its large number of readers, do deliver the message covering this problem and, through their own work and in support of other activities for community betterment, contribute in a practical way to its solution.

5. That all business men and organizations do seriously consider the ways in which this problem affects the health and efficiency of workers, and use their influence to improve conditions by urging and assisting movements for better sanitation and hygiene in their communities and for the provision of wholesome recreation.

6. That all colleges and normal schools preparing teachers make provision for adequate instruction in the problem of sex education, which will prepare these teachers more

effectively to meet the demands of the various communities which they serve.

7. That the theological schools preparing ministers recognize the tremendous bearing which sex has upon every aspect of moral and religious life and that they take the necessary practical steps to enable the future ministry to use this great endowment of the human race intelligently and constructively.

8. That the Board of Nurse Examiners make adequate knowledge of social hygiene and venereal diseases a requirement for certification as a registered nurse.

9. That the members of this conference and others whom they may interest and associate with them in this program do keep in communication and co-operation with the local health authorities and the state board of health and welfare agencies, in order that there may be a constant development, and follow-up of all activities for the solution of the great and important problems of venereal disease control and sex hygiene.

The chairman of the committee is Dr. D. C. Suggs and the secretary, Mrs. Charlotte Hawkins Brown.

The State of North Carolina and the U. S. Public Health Service in coöperation with the local health authorities have established venereal disease clinics in eleven cities and towns, Ashville, Charlotte, Clinton, Fayetteville, Goldsboro, Greensboro, High Point, Raleigh, Rocky Mount, Wilmington and Winston-Salem. Most of these will have a clinic six days per week. In order to supplement this work the state has issued instructions to physicians, outlining what it furnishes and does and giving information with reference to prices and means of obtaining supplies. The state will make free Wassermann tests, will furnish arsphenamine, has a "Red Book" of instructions, and is planning for meetings and conferences to bring the facts to the attention of the men engaged in the work.

The North Carolina Bulletin for June, 1919, calls attention to the terrific toll that ignorance and carelessness exact in the field of smallpox alone. With this disease carelessness is apparently the biggest factor in its prevalence. Science has known how to absolutely prevent smallpox for 125 years; yet in North Carolina alone there were 1,688 cases in one year with 265 in a single city. If it were not for the preservation of the industrial efficiency of our nation, perhaps it would be well to let those who are careless suffer this loathsome disease as a price of their indifference.

The time is not far distant when local health authorities will be held responsible for an epidemic of typhoid fever.

In four years the North Carolina health department has succeeded reducing the typhoid death rate in the state from 35.4 to 23.6, and this in face of some counties who pay so little attention to the disease that they permit a rate of 75.6.

During the coming summer a campaign for complete vaccination is to be conducted in 30 counties of the state. This campaign should result in a still greater reduction of the typhoid rate. Complete vaccination combined with sanitary privilege would gradually eliminate the disease.

A recent bulletin of the North Carolina state department of health points out that the pulpit and the press are practically silent on the moral responsibilities of each man for the health of his neighbor. Certainly a man's duty towards the health of his fellow-man is fully as great as his duty towards the morals of his fellow-man.

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Ohio.—In co-operation with all the states of the Union, the Ohio state department of health opened its "Keeping Fit" campaign on March 1. This fight against venereal diseases has been prompted by conditions revealed during the examination of the second million drafted men.

An exhibit consisting of a series of cards has been prepared and these, together with other literature, is used to instruct the public concerning the prevention and spread of social diseases. Pamphlets have been compiled for the boy and girl of high school age, for parents and educators and will be distributed through the commissioners of health in the various counties, through ministers and school superintendents.

Several counties have already planned the carrying out of the campaign and have arranged to have lectures accompanied by lantern slides especially prepared to show the effects of the diseases, so that the public may do its share in effectively stamping them out.

Measures for the prevention of quarantinable diseases which are now prevalent, though not widespread, in the state, have been sent to the health commissioners of the various coun-

ties. These diseases include smallpox, scarlet fever and diphtheria.

Thoroughness in treating a patient with one of these diseases will most always reveal the source of the infection and will often expose concealed and obscure cases. If the source is found and the exposures dealt with promptly and correctly, diseases will not spread. Quarantine is always necessary and should be made as light a burden as possible; the reason for it should be carefully explained to the patient's family and absolute adherence to the rules should be demanded.

In diphtheria, the patient should be isolated and this quarantine should be continued until he is no longer capable of communicating the disease. Swabs should be taken from the throats of other members of the family. If the swabs from the throats of the breadwinners prove negative they may be allowed to work, providing the patient is properly isolated. If this is not possible, strict quarantine of all members of the family should be enforced. When two successive throats swabs of patient prove negative and swabs from the other members of the family, taken not less than forty-eight hours apart are also negative, the house may be disinfected and the quarantine raised.

Where a patient is suffering with scarlet fever, he should be quarantined until no longer capable of communicating the disease. breadwinners who are immune by reason of a previous attack may be allowed to work, provided they do not come in contact with the patient or the food supply. When disinfection has been performed, children who have not had the disease should remain under quarantine for at least 10 days.

In the case of smallpox, the patient should be quarantined until there is no longer danger of the spread of the disease. Quarantine in a case of smallpox includes everyone in the house except those who have had the disease or who have been recently successfully vaccinated.

Complying with the provisions of the Griswold Act which amended the Hughes Health Law, 50 of the 88 counties of the state have organized and 39 new health commissioners have been appointed. Twelve of these are to serve full time. In three districts the city and county have agreed on the appointment of the same commissioner. Of the 50 districts already organized 25 have made provisions for a public nurse and 30 nurses have already been named.

While in some districts difficulty has been encountered in providing finances for 1920, in practically all of these the auditor and the advisory council have been working in coöperation and have been able to provide at least a minimum amount for the current year. The budget for 1921 will be adopted in April in time for submission to the budget commission so that provision may be made in the tax levies for financing the organizations on a permanent basis.

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Utah.—The Division of Health Education of the State Department of Public Instruction has sent out widely its suggestions for protecting the mental health of children. These follow eminently sensible lines.

Parents and teachers alike should be advised as to the points in child training that are valuable as promoting and preserving mental health.

Give your child opportunity for a variety of wholesome activities and interests.

Train your child to work hard in some regular occupation suited to his ability and talents, but to avoid fatigue by alternation of work and rest.

Train your child to give attention to the present situation rather than to the future.

Train your child to strict obedience in a few important matters and let him alone in regard to the unimportant things.

Avoid conditions that tend to produce overstrain or precocity. The special business of a young child is to be a child—to grow and to play with other children.

Protect your child from shocks. Do not frighten him yourself or let other people do so.

Encourage frankness and directness.

Give your child a variety of well cooked wholesome food in ample quantity at regular intervals.

Train your child to avoid drugs and stimulants of all kinds.

Train your child to healthful habits of sleep in fresh air, giving opportunity for at least nine hours, and for more than that before the age of twelve.

If your child shows any difficulty in adaptation—sleeplessness, emotional storms, fears, irritability, persistent delinquency—consult a competent physician at once.

Take advice of a competent person concern-

ing the peculiar, sensitive, or nervous child, in order to correct a possible unfavorable inheritance by proper education and environment.

The best method of training is by example.

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West Virginia.—A conference of all State Health Agencies with representatives from State Agricultural Extension Department, State Department of Schools, National Red Cross and National Anti-Tuberculosis Association, was recently called by the state health commissioner of West Virginia for the purpose of coöperation, and coördination of forces, in order to avoid overlapping, duplication and consequent waste of time, energy and money in health work in the state. The definite outcome of this was a plan for several intensive county health campaigns during the year in which all the organizations will unite their forces, upon invitation from a county, with the specific purpose of establishing a health center in the county with a full-time health officer. The campaign is already on in Upshur county and making good progress and Logan county is now organizing to begin their campaign in March.

At the annual convention of West Virginia, Federation of Women's Clubs, the following resolution was presented by the public health committee and endorsed by the convention:

Realizing that physical development is the foundation for mental development, and deploring the appalling percentage of maternal and infant deaths and the astounding number of undernourished children, be it

Resolved, That the West Virginia Federation of Women's Clubs endorse the "Child Health Organization" program, which provides for standard bar scales in every public school, and the record chart recording weight, in each room; and be it further

Resolved, That the West Virginia Federation of Women's Clubs stimulate interest for the appointment of a public health nurse in every community, and interest high school graduates and college women to enter training schools for nurses and fit themselves for the public health field.

Be It Further Resolved, That the national committeemen in the two dominant parties be instructed to advise the creation of a "United States Public Health Department," with a national secretary of public health.

The West Virginia state health department has planned a conference of all health officers of the state to be held in Huntington April 13-14th. The public health nurses of the state have been invited to attend and take part in this conference and are represented on the program.

A plan for coöperation and coördination in public health nursing has been worked out in West Virginia between the American Red Cross and the state department of health that seems to be ideal. The supervision of the Red Cross public health nursing service has been put under the division of public health nursing of the state health department, the director of the division sending in a monthly report and holding a monthly conference with the director of the bureau of public health nursing, Potomac division. Because of the added responsibility and increase of work that this entails and because of the limited appropriation of the state health department, the Red Cross has assumed the salary of an assistant until July, 1921, when necessary funds from the next legislature should be available. The Red Cross is also paying one-half the salary of a full-time stenographer for the division, because of the increased clerical work.

The San Francisco Meeting Is Only Five Months Away
August 30-September 3—Note the Date
Are You Making Your Plans?

PUBLIC HEALTH LABORATORY NOTES

Abstracted by Francis H. Slack, M. D., and Mr. James M. Strang.

Investigations of the Etiology of the Influenza of 1918.—Since Pfeiffer's bacillus is found so inconstantly in cases of grippe, Burckhardt does not regard it as the causative factor. The diplococci causing pneumonia, pleuritis and other complications, as well as gram-negative cocci, are also excluded. Although a variant of the streptococcus family, as yet unknown, may be concerned, the author is inclined to attribute the disease to a filterable virus.—Burckhardt, *Centralbl. f. Bact.* 1919, 68, 425.

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Cerebro-Spinal Meningitis from a Micrococcus.—A case of meningitis caused by *Micrococcus tetragenus albus* is described. The morphology and cultural characteristics of the organism are given in detail. Several illustrations and a noteworthy bibliography are included.—Riemsdyk, *Zeit. f. Hyg. u. Infekt.*, 1919, 89, 146.

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Observations of the Culture of Paratyphoid B.—The authors have demonstrated by several series of experiments that paratyphoid B may be easily isolated and grown on a selective medium which is essentially a Drigalski agar rendered alkaline by the addition of NaOH or KOH. Ten to twelve cubic centimeters of normal KOH added to 100 of medium give the best results. Coli and other fecal organisms, with the exception of *Coli capsulatus*, are very strongly inhibited, while the conditions for the development of paratyphoid B are greatly improved. The number of colon organisms present apparently has slight effect upon the growth of this bacillus. *C. capsulatus* is not always inhibited, but can be distinguished from paratyphoid B by the shape of the colony. Organisms from other sources which grow readily on alkaline media are rarely found on these plates.

In 308 cases investigated for the presence of paratyphoid B in the feces, 110 were found positive by the ordinary media and 58 more by this special medium. Rarely does this organism grow on ordinary media and not on the alkaline. Cultures which give a typical colonies on such media rapidly become normal on successive cultivation on the medium described.—Felseneich, *Zeit. f. Hyg. u. Infekt*, 1919, 89, 88.

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The Cultural Differentiation of Beta Hemolytic Streptococci of Human and Bovine Origin.—Hemolytic streptococci are common in good dairy products and are usually harmless to the consumer. They may be distinguished from hemolytic streptococci pathogenic to man by (1) Their action on blood in fluid media; (2) Their appearance in the blood agar plate; (3) Their fermentation reactions; (4) Limiting Hydrogen-Ion concentration in dextrose bouillon; (5) Their growth in milk; (6) Their reaction to methyl blue. None of the procedures described serves by itself to differentiate streptococci of human and bovine origin with certainty, although each of them serves as a strong presumptive test. Most strains fall easily into the human or bovine group by all the tests. —J. H. Brown, *Jour Exper. Med.*, Jan., 1920, 35.

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Dairy Infection with Streptococcus Epidemicus.—The authors' report on the investigation of a streptococcus epidemic due to *S. epidemicus*. The infection was traced to the milk from a single quarter of the udder of a cow in a dairy of 112 cows producing an otherwise excellent grade of milk. The streptococcus isolated from the cow was in every respect like streptococci isolated from patients and milkers, and different from those usually found in normal cows, or cows with garget. Certain recommendations are made to safeguard producers of raw milk against the occurrence of such epidemics.—J. H. Brown and M. L. Orcutt, *Jour. Exper. Med.*, Jan. 1920, 49.

✝

Culture Media from Fish.—The authors summarize experiments on the use of fish in the preparation of culture media in place of the more expensive meat juice and peptone. The ordinary bacteria, both ærobic and anærobic, were found to grow very well on these media.—Harde and Hause, *Comptes Rendus*, 1919, 82, 1259.

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh, P. M. Holmes, and E. B. Starr.

The Empty Sugar Bowl—A Benefit to Health.—Before the war the average person consumed about 75 to 80 pounds of sugar per year, hence its increase or decrease in the dietary has some importance. Sugar requires practically no digestive manipulation in the human body. Sugar is utilized by muscle cells to generate heat and to produce muscular energy for both mental and physical processes. Starchy foods are eventually changed by the digestive fluids into sugar, but this requires the action of the digestive fluids and requires a longer time. It is believed that this is healthful, it gives the digestive mechanism employment. Sugar is a concentrated food and represents considerable fuel in a small package. Sugar is digested better by those who do hard manual labor than by those doing office or clerical work. Excess of sugar in the stomach ferments and the toxic substances result in digestive disturbances, constipation, bad complexions, pimples, etc. All sweet foods should be eaten sparingly. Eating sugar is a habit, and one that is in most instances decidedly detrimental to health. Forty years ago we were using 8 pounds of sugar per capita; today there are twice as many men dying between the ages of forty and fifty. The sugar shortage no doubt will be a blessing in disguise to many of us and it will work hardship on no one. An abnormal craving for sweets can be satisfied with fruits.—H. H. Smith, Chief Surgeon, *American Rolling Mills Company Bulletin*, December, 1919, Middletown, Ohio, pp. 44-45.

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New Basis for Measuring Accident Frequency and Severity Rates.—The International Association of Industrial Accident Boards and Commissions has adopted the following resolution: *Resolved*, That accident rates, both frequency rates and severity rates, be computed on the basis of 1,000 hours' exposure instead of 3,000 hours' exposure, as heretofore. The unit of measure for both frequency and severity accident rates, which has come to be generally used, is the "300-day worker," sometimes called "full-time worker." This hypothetical worker is supposed to work 10 hours a day for 300 days in the year, or 3,000 hours per year. The committee on statistics and compensation insurance cost at its first meeting considered very carefully the question of a proper unit for measuring accident rates and decided to adopt the only unit then in actual use, namely, the "300-day worker." The 300-day worker was chosen as the standard measure for accident rates because (1) it is absolutely necessary to have a common unit for measuring accidents in all occupations, all industries, all states and all countries; (2) the 300-day worker had been recommended as the standard unit for computing accident rates by the Permanent International Committee on Social Insurance and the International Institute of Statistics and was in use in Germany and Austria at the time the committee on statistics took up the matter of standardization of accident statistics; (3) it was alleged that most workers did work about 10 hours a day and about 300 days in the year. It was further argued that while the 300-day worker did conform closely to the normal worker, still he was merely an abstraction, a unit of measure, and would measure exposure to accident just as accurately for an 8-hour day as a 10-hour day, for a 200-day year as a 300-day year. The use of this unit, it was maintained, did not suggest a 10-hour day or a 300-day year as the ideal and proper working day and industrial year.

In view of the fact that the working time, both the hours per day and the days per year, varies widely from plant to plant, from industry to industry, from city to city, from country to country, and from year to year, it was thought best by the committee to cut loose entirely from a unit of measure that could be misunderstood as, in any way, implying what the proper working time should be. The adoption of 1,000 hours' exposure rids us forever of any such implication and gives a unit which is convenient in size and will remain unaffected by changes in the working day or variations in the working year. The 1,000-hour exposure is a stable, scientific, mathematical unit of measure, which is what is needed for the measurement of accident rates. It has the

further advantage that accident rates measured by any other unit of exposure may be readily expressed in terms of the 1,000-hour unit and vice versa.—*U. S. Monthly Labor Review*, U. S. Bureau of Labor Statistics, Jan., 1920, pp. 218-219.

✣

A Standard Method of Industrial Sickness Reporting.—Two plans have been prepared by the Public Health Service in cooperation with the American Public Health Association and the asistance of certain government bureaus. The first plan is considered preferable as offering possibilities for much greater detail in personnel records. In both it is considered essential that a diagnosis of each case of sickness causing disability be recorded.

PLAN A.

According to Plan A, a card is kept for each individual employed. It is 4 by 6 inches in size, and is shown below, both the face and the reverse.

From these cards, monthly tabulated statements can be made which show the number of workers, the number of cases of sickness occuring among them and the sickness rate per 1,000 persons for any group of workers. Tabs or signals in certain divisions of the top of the card are suggested, to designate sex, color and age group. Thus a blue signal in the left third of the top of the card might indicate "white male, under 25 years," in the middle third, "25 to 44 years," and in the right third "45 years and over." A distinct signal, for any

1. Name of Employee	2. Check No.	3. Date This Record Begins	4. Firm No.	5. Date Employment Ended
6. Color and Sex	7. Year of Birth	8. Marital Condition	9. Speaks English	10.

11. Departments and Occupations in Plant.

From	To	Months	Department	Occupation	Possible Injurious Conditions

12. Former Occupation Outside of Plant.

From	To	Months	Occupation	Industry	Possible Injurious Conditions

13. Remarks.

The reverse side as follows:

Record of Absences from Sickness and Non-industrial Injuries.

14. Dates of Absence		15. Days Lost Through Illness	16. Sickness or Non-industrial Injury Causing Disability (Diagnosis)	17. By Who Diagnosed
Beginning	End			

18. Remarks:

Form A-1-1919—U. S. Public Health Ser.

illness, attached at the time to the card and removed at the end of the month, will facilitate the keeping of the sickness record.

PLAN B.

This is a simplified plan for those plants and sick-benefit associations which find it impossible to keep a personnel card for each employee. It affords a method of handling employees in groups.

Knowledge of hours of work in relation to fatigue and output.

Knowledge of the security and continuity of employment during slack periods and while recuperating from accidents or disease.

Knowledge of working conditions, such as safeguards from all dangers, social and physical; plant beautification, community conditions.

.....
(Name of plant or sick-benefit association)

Number of employees (or members) on the last day of ..... 19.....
(Month)

Department (or occupation)	Total (both sexes)				Males				Females			
	All ages	Under 25	25 to 44	45 and over	All ages	Under 25	25 to 44	45 and over	All ages	Under 25	25 to 44	45 and over
Total.....												

The Public Health Service invites establishments and employes' sick-benefit associations to take up this question direct with the service. —*Monthly Labor Review*, U. S. Bureau of Labor Statistics, January, 1920, 220-223.

✚

Qualifications of an Ideal Medical Officer for a Modern Manufacturing Plant.—In a recent discussion at Atlantic City on the scope of industrial surgery, Dr. C. E. Ford mentioned the following qualifications as required, in his opinion, by an ideal medical officer for a modern manufacturing plant:

Five years' general practice "to acquire a knowledge of a man and his foibles."

Knowledge of the special problems arising from the employment of women and children.

Knowledge of the workings of pensions and insurance.

Working knowledge of plant organization.

Knowledge of employment methods, including job analysis.

Knowledge of wages in relation to the cost of living according to local standards.

Ability to direct athletic and social activities.

Ability to replace injured to best advantage.

Working knowledge of company stores.

Knowledge of housing conditions and problems with ability to remedy defects.

Knowledge of labor turnover and its causes.

Ability to direct general education and Americanization of employes.

Such a medical man would indeed be a "superman" in almost any walk of life and deserve the salary of a popular opera tenor.—J. B. R., in *Pennsylvania Medical Journal.*

✚

Health Truths

Think of public health first and low taxes afterward.

A well organized health department can save more lives and more dollars than fire or police departments.

A person who thoughtlessly or willfully spreads communicable disease which causes death certainly commits a crime. What is manslaughter?—*Our Communal Health.*

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